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Internal Audit and Evaluation

Vérification interne et Évaluation

REVIEW OF THE PROMOTION PROCESS FOR RESEARCH SCIENTISTS

Fisheries and Oceans / Pêches et Océans

Canada

REVIEW OF THE PROMOTION PROCESS FOR RESEARCH SCIENTISTS

Internal Audit and Evaluation Branch
February 1993

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HIGHLIGHTS

- There are 292 research scientists in the Department of Fisheries and Oceans (DFO) conducting research related to fisheries and oceanography; in total, there are about 2200 research scientists in the federal government, located primarily in seven science departments and covering several natural science disciplines.

- By definition, research scientists are engaged in the generation of new knowledge. Their contribution to original scientific knowledge differentiates them from other non-research scientists such as biologists or physical scientists who apply existing knowledge.

- These research scientists are classified as RESs. There are five levels in the RES classification. Treasury Board imposes quotas on the number of research scientists at the higher levels. A department is permitted to have 20% of its research scientists at the RES-3 level, 25% at RES-4 and 5% at the RES-5 level.

- The promotion process for research scientists is incumbent based, i.e., a RES can remain in the same position, but the level of the position can change according to the level of productivity and achievements of the incumbent, as determined by a promotion board.

- Five criteria have been established interdepartmentally for promoting research scientists: productivity, creativity, recognition, leadership, and scope of decision making. These criteria measure primarily scientific excellence.

- Concerns have been expressed in DFO and other science departments about the promotion process. The perception is that this process appears to place greater emphasis on the excellence of scientific research than on its relevance to departmental objectives and priorities and usefulness to clients. Internal Audit and Evaluation Branch was asked to study these concerns as they relate to DFO.

Profile in DFO

- Sixty-six percent (192) of DFO research scientists began their career with DFO directly after graduating with a PhD or as Post-Doctoral Fellows. Over 60% of all DFO research scientists started with the department in the 1970s or earlier.

- One-third of DFO's research scientists are older than 50. About 9% (23) of them are eligible to retire immediately and another 13% (39) will be eligible for retirement in the next 10 years. DFO has only one RES under the age of 30 and 23 RESs under the age of 35.

- The RES group is the second highest paid group in DFO. The RES salary range is approximately $37,000 – $92,000 and overlaps that of EX-1 to EX-3. The average salary of a DFO research scientist is $70,800.

- DFO research scientists received significant increases in salary over the last three years because of economic adjustments to their pay rates (4.7% in 1990-91, 0% in 1991-92 and 3% in 1992-93), automatic annual pay increments (3-4%), conversion to a new RES classification system in 1991-92 ($3-6,000 average) and promotions ($2-4,000 average).

- Promotions in the RES group normally occur at an approximate rate of 5-6% per year. However, in 1991-92, 58% (173) of DFO research scientists had their levels upgraded, 73 (25%) because of promotions and 100 (34%) as a result of conversions to the new RES classification system.

- Of the 292 research scientists in DFO, 10% (30) are women, 9% (25) are Francophones, 7% (22) are visible minorities, and 2% (7) are persons with disabilities.

Promotion Process

- Regional promotion committees and a departmental Research Scientist Appraisal Committee (RSAC) conduct the DFO promotion process annually. The membership of these committees comprises primarily research managers and scientists. There is no participation from senior management and internal or external clients.

- The number of promotions available at each level in a given year is a function of the quotas of RES-3, RES-4 and RES-5 that the Department is permitted. To calculate these quotas, the DFO Research Scientist Appraisal Committee has been using a budgeted figure for the total RES complement which significantly exceeds the actual complement (difference of 45 in 1992-93). Based on this difference, if all quotas were filled, the Department would have about 22 more research scientists at senior levels than what the actual complement would justify.

- DFO, like most other science-based departments, has never reversed a promotion. There is no mechanism to ensure that, once research scientists have been promoted, they continue to perform at that level. The annual performance appraisals are not closely linked to the promotion process.

- The promotion process is perceived by many research scientists as being unfairly conducted at both the regional and the national level. Concerns expressed include politics and the role of personalities on the committees, lack of representation of all relevant specialities on the committee, lack of information on what is needed to get promoted (i.e. benchmarks), and inadequate feedback for those who did not get promoted.

Criteria used for promotions

- DFO uses a 60 point-rating scale and awards 10 of the 60 points to productivity, as evidenced by primary scientific publications. Ten points are awarded for productivity as measured by technology transfer, cooperative research, technical or departmental reports, consultative and advisory contributions. The remaining 40 points are divided equally among creativity, recognition, leadership and scope of decision-making criteria.

- The criteria are not perceived by research scientists as being consistently applied at the regional and national levels. Concerns cited include varying degrees of emphasis on different criteria across regions and across the years; lack of information on what will be recognized and rewarded; and too much emphasis given to quantity of publications rather than quality.

- Major communication problems have resulted in misconceptions and misinterpretations about how the RES promotion process is actually conducted, who is involved, and what weighting is applied to the criteria.

Linkage of Promotion Criteria to DFO Objectives

- The application of the above weighting in DFO, particularly in the past, favoured productivity as measured by the number of scientific publications as opposed to contributions to departmental objectives and priorities.

- A large proportion of the research scientists interviewed stated that the nature of their work is shifting. Operational managers' expectations are also shifting: they recognize that while scientific excellence is crucial to the credibility of the scientific advice provided by the department, the research they do has to be useful in meeting the departmental objectives. Thus, the work being demanded of research scientists is increasingly of an applied nature: they are asked to work on shorter term, client-focused research. A number of research scientists and operational managers felt that this has resulted in confusion and an unclear distinction between the role of research scientists and that of biologists and physical scientists in this department.

Outside DFO

- Federal science departments all use the same five promotion criteria established interdepartmentally. The interpretation and application of these criteria vary slightly from one department to another as does the promotion process.

- Interdepartmentally, some work is underway to explore the issues discussed in this review: ways to emphasize relevance of research to mission and objectives, aging population, revitalization, and ongoing performance assessment.

- The prevailing trend in most organizations and agencies in Canada and worldwide is to conduct targeted research that is relevant to the organization's mission. To reflect this change, promotion criteria for research scientists are shifting away from scientific excellence as measured traditionally by publications. The focus is more on tangible results, such as patents, technology transfer, and industry support and acknowledgment of value of work. Private-sector organizations emphasize application of the research findings as the main criterion for promotion.

Recommendations

- In light of our findings, recommendations are made to review the appropriateness of RES classifications in DFO; base quotas for senior RES levels on the actual number of research scientists; ensure the reversibility of the promotion process such that classification and salary levels correspond to ongoing actual performance; amend promotion criteria to recognize and reward activities that result in tangible benefits to DFO and its clients; simplify the promotion process by eliminating duplication and improving the transparency and fairness of the process; involve senior management and clients more directly in the promotion process; and facilitate communication and better understanding of the promotion process and criteria.

1. Introduction

1.1 Background

The Science Sector of the Department of Fisheries and Oceans (DFO) represents approximately 29% ($229M) of the department's total 1992–93 financial resources and 36% (2210) of its total person-years (PYs). The objective of the Science Sector is "to ensure that scientific information of high international standards is available to the Government of Canada for use in developing policies, regulations and legislation regarding the oceans and aquatic life, and to other government departments, private industry and the public for use in planning and carrying out aquatic activities" (source: "Department of Fisheries and Oceans 1992–93 Main Estimates, Part III"). This objective is achieved through three sub-activities: Biological Sciences, Physical and Chemical Sciences, and Hydrography.

A variety of scientific and professional staff contribute to this objective, including primarily biologists, research scientists, scientific regulation officers, engineers, physical scientists, chemists and laboratory technicians. In DFO, the research scientist (RES) group is the second largest after biologists and is known for its prestige in the scientific community and its special promotion process.

The Acting Assistant Deputy Minister of Science, the Regional Directors General for Quebec and Pacific and the Director General of Personnel identified the need for a comprehensive review of the process and criteria used to promote research scientists in DFO. Some regional directors general had raised concerns that the criteria and process appear to place greater emphasis on scientific excellence than on (*i*) the relevance of the research to DFO objectives and priorities and (*ii*) the tangible benefits to internal and external clients that arise from application of the research. Research scientists themselves voiced some concerns about the process and the criteria after the last promotion exercise.

The need for this review is also supported by the "Audit Report on Physical and Chemical Sciences" (April 1992), which recommended that DFO review the performance appraisal process for research scientists in that Directorate. The audit indicated that the criteria used to evaluate performance may at times be incompatible with DFO's operational objectives and the provision of service to clients. Since this issue affects more than the Physical and Chemical Sciences Directorate, DFO broadened this evaluation to a review of the promotion process for all its research scientists.

The performance review and career progression process for research scientists was also an area identified for further review by the Office of the Auditor General in 1988 in its comprehensive audit of the department. A number of the issues raised by this study were also identified at that time but no action was taken to address the concerns raised.

The approved terms of reference for this review (Appendix A) called for the Internal Audit and Evaluation Branch to provide the following:

- a complete description of the criteria and process currently applied in DFO, including an explanation of how the promotion system is linked to departmental objectives and priorities; if appropriate, the review was to suggest changes to the criteria and process to better reflect the needs of the department;

- information on whether the present process is fair and whether the criteria are equitably applied in all regions and to all levels of the RES group;

- alternatives derived from the processes used in other science-based federal departments, other jurisdictions including the private sector, and other countries; and

- information on the promotion process for other professionals, particularly biologists, engineers and commerce officers.

1.2 Methodology

We gathered information for this study by various methods:

1.2.1 Personal Interviews

We interviewed more than 100 people in person or by telephone:

- Face-to face interviews were conducted with 75 DFO research scientists from across the country (see Tables 22 and 23). We selected them by stratified random sampling to reflect RES levels, disciplines, gender, length of service in the department, conversions from other categories, recent promotions and no promotions. The 75 research scientists answered a standard set of questions (Appendix B – Interview Guide for Research Scientists; two former research scientists pre-tested the interview guide in the Ottawa office). We entered the quantitative responses into a database and analyzed them (Appendix C). We grouped the qualitative responses to each question and entered them into a computerized file to allow comparisons across all interviews.

- Face-to-face interviews were conducted with 5 of the 6 DFO regional directors general (RDGs) and all regional directors of Science (RDSs) in the six regions. The standard set of questions developed for this group is presented in Appendix B.

- Four of the six regional directors of Fisheries and Habitat Management and five of the six regional directors of Inspection were interviewed. Interview guides developed for these directors are presented in Appendix B.

- Also, a number of research managers (REMs) and executives (EXs) responsible for research scientists and research programs were interviewed.

1.2.2 File Reviews

- The regional directors of Personnel provided 70 appraisal and promotion files of research scientists from across the country. The files had been selected by stratified random sampling to reflect RES levels, disciplines, gender, length of service, conversions from other categories, recent promotions and no promotions.

- The Science Sector, Personnel and Finance provided files relevant to the promotion criteria and process.

- The regional directors of Science provided files pertaining to the regional promotion process.

- Personnel and Science Sector provided statistical data on the RES community in DFO.

1.2.3 External Contacts

- We asked five federal science departments with the largest complement of research scientists (Agriculture Canada, Energy, Mines and Resources Canada, Environment Canada, Health and Welfare Canada, and Forestry Canada) for data on their RES community, promotion process and criteria (Appendix D).

- We examined the promotion systems used by National Defence and External Affairs for their Defence Scientists and Foreign Service Officers, respectively. These systems are similar to the one used to promote research scientists.

- We consulted representatives of Treasury Board, the Interdepartmental Advisory Committee (IAC) for the Promotion of Research Scientists, the Working Group on the Management of S&T Human Resources, and the National Research Council of Canada.

- We met with a representative of the Professional Institute of the Public Service of Canada (PIPS).

- We conducted telephone interviews with Bell Northern Research, Atomic Energy of Canada Limited, Hydro Quebec, and Spar Aerospace to obtain data on their promotion process and criteria for research scientists.

1.2.4 External Advisors

- Dr. Peter Larkin, retired Vice-President, Research, University of British Columbia, gathered data on the promotion process and criteria used in United States, United Kingdom, Australia, New Zealand, Germany, China, Japan, Iceland and Norway (Appendix E).

1.3 This Report

Chapter 2 presents a demographic profile of the research scientist community in DFO. Chapter 3 describes the key players in the federal government research scientist community; Treasury Board requirements for membership in the RES group; the evolution of the current promotion criteria; and the current promotion process in DFO. Chapter 4 discusses the issues raised by the study and findings from the interviews and file reviews. Chapter 5 discusses alternative approaches to promotion decisions in other federal science departments, other agencies including the private sector, and other countries as they relate to the issues raised by the study. The final chapter presents the recommendations emerging from this study.

2. Profile of DFO Research Scientists

The statistical profile of a DFO research scientist can be characterized as follows:

a 46-year old male with a PhD in a field related to either ocean or fisheries science who started his career at DFO in the mid to late 1970s, is nearing the highest level of his career (not yet at the top) with an average salary of $71,000.

This chapter elaborates on this statistical profile and examines the distribution of research scientists by level, region, age, employment equity groups, year of appointment and the movement within this group. Most of this section could have been an annex but is located here as it is important to understanding the outcome of the appointment and promotion process that has been in place for research scientists for the last several years.

2.1 Evolution of DFO's Scientific Population

In a comparison of the major federal science departments (Table 1), DFO has the third largest number of research scientists (RES) in government, approximately 13% of the total.

Table 1: Distribution of Research Scientists in the Federal Government

Department	# of RESs	% of total RESs
Agriculture	795	36.5
Energy, Mines and Resources	471	21.6
Fisheries and Oceans	*292*	*13.4*
Forestry	219	10.0
Environment	194	8.9
Health and Welfare	133	6.1
Communications	55	2.5
National Defence	16	0.7
Customs and Excise	4	0.2
Total	**2,179**	**100.0**

Since 1987, the population of Research Scientists (RES) in DFO has increased slightly as demonstrated in Table 2. Similarly, Research Managers (REM) have increased steadily. Research Managers manage or coordinate research and development programs in addition to providing advice on the direction, conduct and management of these programs. In 1991-92 alone, the REMs increased by more than 50% (7) as a result of new research programs being implemented at the Maurice Lamontagne Institute (MLI) in Mont-Joli as well as some conversions from senior management (SM or EX) to the REM group.

Table 2: Evolution of DFO's Scientific Research Population*

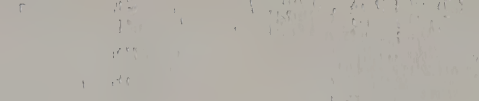
Fiscal Year	Research Scientists (RES)	Research Managers (REM)
1987-88	275	7
1988-89	283	11
1989-90	306	12
1990-91	299	13
1991-92	301	20
1992-93	292	23
Difference	+17	+16

* Sources of data: Personnel and Main Estimates Part III (due to discrepancies in the two sources, minor adjustments had to be made to reconcile the figures)

The 292 research scientists employed by DFO work in two broad areas related to ocean and fisheries sciences: Ocean scientists study the climate and processes of the oceans, while fisheries scientists study stock assessment, toxicology, fish habitats and aquaculture to name a few areas of research. These research scientists are highly specialized and their interdepartmental mobility is quite limited. Research scientists rarely move out of the RES group; however, some follow the management stream and become research managers (REMs) or senior departmental executives (EXs).

The RES group is one of 11 in the Scientific and Professional (S&P) category at DFO (see Table 3). The Biologist (BI) group is the largest (38%) in the S&P category, and the RES group is the second largest (25%). However, the average RES salary ($70,800 in 1992-93) was about 45% higher than the average BI salary ($49,000).

The salary ranges of the upper levels of RESs (RES-3, RES-4 and RES-5) overlap those of EX-1, EX-2 and EX-3 in the Executive (EX) group (Table 4). An analysis of the average salaries of various occupational groups in DFO reveals that Executives (EX), Scientific Research Group which includes Research Managers (REM) and Research Scientists (RES)



and Commerce Officers, in that order, have been the three highest paid groups over the past 10 years.

Table 3: Scientific and Professional Category at DFO

Group	Number	Percent	Average DFO Salary ($)	Salary range ($)*
Biologists	442	37.9	48,851	21,200–74,000
Research Scientists	**292**	**25.1**	**70,800**	**37,000–92,900**
Scientific Regulation Officers	115	9.9	45,748	19,500–68,800
Engineers	104	8.9	56,058	29,700–80,500
Physical Scientists	80	6.9	53,282	23,000–79,000
Economists	57	4.9	54,218	20,600–81,400
Chemists	41	3.5	45,382	23,700–75,600
Research Managers	**20**	**1.7**	**81,316**	**59,300–86,900**
Librarians	12	1.0	41,951	26,100–56,500
Architects	1	0.1	-	22,100–80,400
Home Economics	1	0.1	-	30,200-53,800
Total	**1,165**	**100.0**	**-**	**-**

* As of October 1992 (rounded to nearest hundred)

Table 4: Salary Comparison of the EX and RES Groups

Executives			Research scientists		
Level	**Number**	**Salary range ($)***	**Level**	**Number**	**Salary range ($)***
EX-1	74	63,300– 84,000	RES-3	48	58,100–76,500
EX-2	24	79,300– 93,200	RES-4	72	69,600–84,900
EX-3	13	87,600–103,100	RES-5	26	76,200–92,900

* As of October 1992 (rounded to nearest hundred)

The average salary of DFO's research scientists is $70,800. In 1992–93, the department will spend $22.4 million directly on RES salaries, approximately 10% of the Science Sector's overall budget.

2.2 Distribution by Level

There are five levels of research scientists in the federal public service: RES-1 to RES-5. RES-1 is the entry level, RES-2 is usually the working level, and RES-5 is the highest level of performance. The salaries range from approximately $37,000 for RES-1 to $93,000 for RES-5. Within each level, there are seven or nine lock-steps, with automatic annual increments of 3–4% (compared to 2-3% for other occupational groups). The incumbent based promotion process is designed for individuals to stay in one position, perform the same function and, based on performance, get promoted through the various levels over the course of their working lives. This is in contrast with the practice for all other occupations in the federal public service (with the exception of defence scientists (DSs)), where promotions are to a new position.

Fifty percent of the research scientists in DFO are at the RES-1 or RES-2 level, as outlined in Table 5. This distribution is comparable with that in other federal science departments.

Table 5: Distribution of Research Scientists in DFO by Level

Level	Number	% of total	Salary range (%)*
RES-1	21	7	37,000–48,700
RES-2	125	43	46,000–68,900
RES-3	48	16	58,100–76,500
RES-4	72	25	69,600–84,900
RES-5	26	9	76,200–92,900
Total	**292**	**100**	-

* As of October 1992 (rounded to nearest hundred)

2.3 Distribution by Region and Level

About 33% of the 292 DFO research scientists are located in the Scotia–Fundy region. A further 23% are located in the Pacific region. Central and Arctic, Newfoundland, and Quebec have roughly equal percentages of the remaining scientists (14, 13, and 11%, respectively). Gulf region has 5% of the research scientists.

Table 6: Distribution of Research Scientists by Region and Level

	S–F	Pacific	C&A	Nfld.	Que.	Gulf	Total
RES-1	3	2	1	2	9	4	21 (7%)
RES-2	42	24	15	18	17	9	125 (43%)
RES-3	16	11	9	9	3	-	48 (16%)
RES-4	27	20	13	7	4	1	72 (25%)
RES-5	13	10	2	1	-	-	26 (9%)
Total	**101 (34%)**	**67 (23%)**	**40 (14%)**	**37 (13%)**	**33 (11%)**	**14 (5%)**	**292 (100%)**

Table 7: DFO Research Scientists at Salary Maximum by Region and Level

	S–F (n=101)	Pacific (n=67)	C&A (n=40)	Que. (n=33)	Nfld. (n=37)	Gulf (n=14)	Total (n=292)
RES-1 (n=21)	–	–	–	6 (67%)	–	1 (25%)	7 (33%)
RES-2 (n=125)	25 (60%)	12 (50%)	8 (53%)	6 (35%)	4 (22%)	2 (22%)	57 (46%)
RES-3 (n=48)	–	–	–	–	–	–	–
RES-4 (n=72)	21 (78%)	14 (70%)	10 (77%)	1 (25%)	5 (71%)	1 (100%)	52 (72%)
RES-5 (n=26)	9 (69%)	4 (40%)	1 (50%)	–	1 (100%)	–	15 (58%)
Total (n=292)	**55 (54%)**	**30 (45%)**	**19 (48%)**	**13 (39%)**	**10 (27%)**	**4 (29%)**	**131 (45%)**

Table 6 illustrates that in most regions there are comparatively few RES-1 scientists, a fact that reflects limited new entrants to the RES group at this level. The exceptions to this general pattern are the Quebec and Gulf regions, where the proportion of RES-1 positions is relatively high. This may be partially attributable to the fact that their research programs were established later than those in Scotia–Fundy or Pacific, where there are several scientists at the RES-5 level.

Approximately 45% (131) of DFO RES population is at their maximum salary level (see Table 7). More than half of the upper-level research scientists (72% of RES-4s and 58% of RES-5s) are at their maximum salary levels. Regional variations exist where more than half of the research scientists in the Scotia–Fundy (54%) region and almost half of those in Central Arctic (48%) and Pacific (45%) regions are at the maximum salary for their levels.

2.4 Age Distribution

The average age of research scientists in DFO is 46 years with a range of 29-67 years. This average age is comparable to the average age of all federal research scientists (47.3). Table 8 illustrates that 30% (88) of the research scientists are older than 50. An examination of the age distribution by level reveals, as expected, that there are no RES-1 incumbents over 45 and only 1 RES-5 incumbent under 45. Only 14% (18) of the RES-2 are over 50, whereas almost 70% (18) of the RES-5 are over 50 and eighteen research scientists are over 60 years of age.

An examination of the age distribution by region in Table 9 reveals that Scotia–Fundy, Pacific, and Central and Arctic have the highest complement of research scientists older than 50. Quebec, Gulf and Newfoundland region have a relatively young cadre of research scientists.

The aging of research scientists is an issue throughout the federal government. The Working Group on the Management of S&T Human Resources (Appendix H) found that the RES group was the only group in the Scientific and Professional category with an increasing proportion of staff over age 50 (from 34% in 1981 to 39% in 1991). This, combined with the fact that this group experienced the lowest level of external recruitment since 1981 (34.3%), will seriously affect the revitalization of the RES community. The Working Group also found that the research scientists have the highest average age of recruitment at 35.4 years due to the years of education required to qualify for the RES group.

The National Advisory Board on Science and Technology (NABST) has stated that the most creative technical period generally ends when scientists are in their thirties and early forties, depending on the individuals and the environment in which they work. Thus, a scientist's individual contribution is likely to be in the early years of a career, whereas mid- or late-career scientists are more likely to be accomplished research leaders, mentors, team builders and networkers. The problem, of course, is one of mix.

Table 8: Distribution by Age and Level

Age (yrs)	RES-1	RES-2	RES-3	RES-4	RES-5	Total
<30	1	-	-	-	-	1
30-35	12	11	-	-	-	23
36-40	4	41	7	2	1	55
41-45	3	29	14	14	-	60
46-50	-	25	10	24	7	66
51-55	-	9	12	17	7	46
56-60	-	6	4	11	3	24
61-65	-	3	1	6	4	14
66-70	-	-	-	-	4	4
Total	20	124	48	74	26	292
>50	-	18 (14%)	17 (35%)	34 (46%)	18 (69%)	88 (30%)

This relationship between age and productivity will affect DFO's ability to deliver its programs over the next 5-10 years. DFO has 23 research scientists who can retire immediately without incurring any actuarial penalties (Table 10) and another 39 who will be eligible to retire within the next 10 years (Table 11), most of whom are in the Scotia-Fundy region (23).

Demographics on the 23 research scientists who are now eligible for retirement reveal that the typical potential retiree is 62 years old, has 28 years of service (27 in DFO and 26 in the same DFO region). Fifteen of the 23 (65%) started their career in DFO and 91% have spent all their career in the same region. Nineteen of them (83%) are at the maximum salary of their level with the total salary expenditures on this group being $1.9 million annually.

It should be noted that not all of the 23 research scientists would be able to retire with full pension benefits since only 3 have over 35 years of service. The range in the years of service (12-40 years) of these scientists reflects the older age at which they join the workforce because of educational requirements.

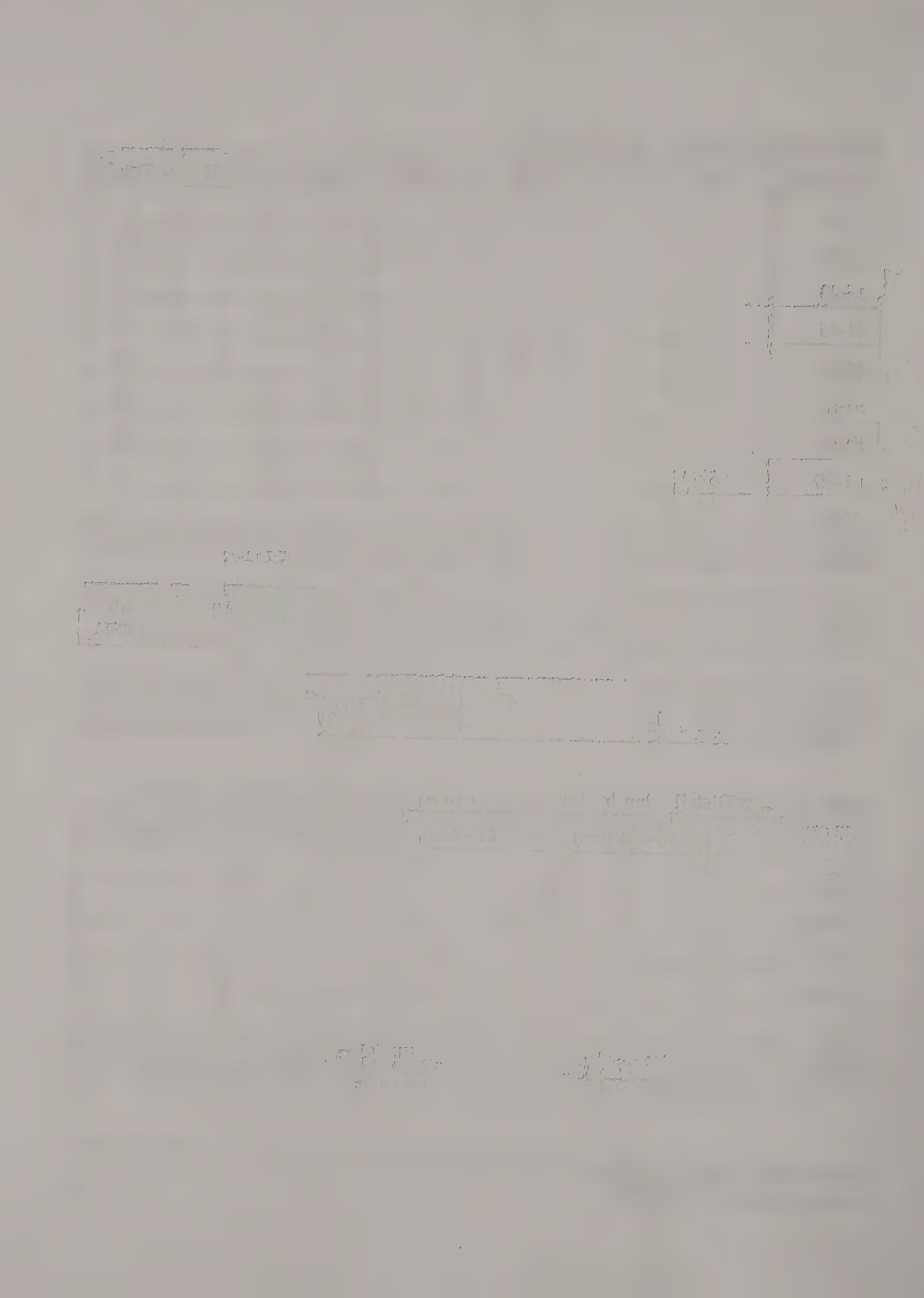
Table 9: Distribution by Age and Region

Age(yrs)	S &F	Pac	C & A	Nfld	Que	Gulf	Total
<30	-	1	-	-	-	-	1
30-35	6	2	3	3	5	4	23
36-40	16	13	2	8	10	6	55
41-45	14	13	11	10	10	2	60
46-50	22	18	10	9	5	2	66
51-55	23	8	8	3	3	-	45
56-60	11	6	4	3	-	-	24
61-65	6	6	1	1	-	-	14
66-70	3	-	1	-	-	-	4
Total	101	67	40	37	33	14	292
>50	43 (43%)	20 (30%)	14 (35%)	7 (19%)	3 (9%)	- -	88 (30%)
Average Age	48	49	47	42	41	39	46

Table 10: Age Distribution by Level of DFO Research Scientists Eligible to Retire

	56-60 (yrs)	61-65	66-70	Total
RES-1	-	-	-	-
RES-2	2	3	-	5
RES-3	-	1	-	1
RES-4	4	6	-	10
RES-5	1	4	2*	7
Total	7	14	2	23

* Two of the four DFO RES-5 above 65 are already retired but work part-time.



Seventeen of these 23 (74%) are at the RES-4 or RES-5 level, 5 at RES-2 and 1 is at the RES-3 level as outlined in Table 10.

Table 11: Scientists Eligible to Retire Within the Next 10 Years by Region and Level*

	S-F	Pacific	Nfld.	C&A	Que.	Gulf	Total
RES-1	–	–	–	–	–	–	–
RES-2	6	2	1	–	–	–	9
RES-3	4	–	1	2	–	–	7
RES-4	9	3	1	–	1	1	15
RES-5	4	3	1	–	–	–	8
Total	**23**	**8**	**4**	**2**	**1**	**1**	**39**

* Excludes those DFO scientists eligible for retirement immediately.

Other federal science departments also face an aging scientific population that is not leaving the workforce quickly enough to make room for younger scientists. Energy, Mines and Resources (EMR) is exploring more flexible retirement incentives (similar to the Voluntary Early Retirement Program that was made available to EXs in 1987) to entice individuals to leave gracefully. EMR is examining several options: pension reciprocity with organizations that employ similar scientists; secondments to the private sector, universities and other levels of government; and enhanced fixed-term employment contracts for certain scientific work. Although some of these issues are most pressing for EMR's aging RES population, it is in the process of seeking support (e.g. joint Treasury Board proposal for the early retirement package for RESs) from other science-based departments.

To enable retired career scientists to continue their research and to transmit their knowledge to new research scientists, the government established in 1987 the Emeritus Research Scientist Program.

Emeritus scientists do not receive a salary but, where approved, their work related expenses are paid and they have access to departmental facilities and equipment. Expenses related to approved projects can include travel, accommodation, and equipment for field work. Treasury Board Secretariat estimates that the work of an emeritus scientist is worth 6-8 times the cost incurred. DFO has nine retired research scientists in this program, seven of them in the Pacific region and 2 in Central and Arctic.

Also in 1987, the government established the Part-time Work and Term Employment Program for retired employees in the Scientific and Professional category involved in scientific activities. Former employees can continue their work, in this case research, and receive compensation for working up to a maximum of 12.5 hours per week, without

affecting their pension. In effect, an employee can retire, after 30 years of service (in some cases after a cash-out is paid), receive a 60% pension and by working 12.5 hours/week, gain a total federal income almost equal to that prior to retirement. DFO has four research scientists, all in Scotia-Fundy region, who are retired and work part-time, one of whom received a cash-out (2-RES-5, 1-RES-4, 1-RES-2).

2.5 Mobility

The majority (63%) of DFO's research scientists were hired in the 1970s or earlier (Figure 1). The average number of years of service in the department is 14.8 years.

The distribution of research scientists by level, not surprisingly, reveals that the majority of all the senior scientists (RES-3 to RES-5) joined the department in the 1970s or earlier, whereas half of those at the working level (RES-2) joined in the 1980s (Table 12).

The distribution of research scientists by region and year hired (Table 13) shows that the two regions with the most research scientists (i.e., Scotia – Fundy and Pacific) hired 70 – 75% of them in the 1970s or earlier. Quebec region recruited most of its scientists after the Maurice Lamontagne Institute was established in 1987. Gulf region more than doubled its complement of research scientists in the late 1980s.

Figure 1 Distribution of Research Scientists by Year Hired

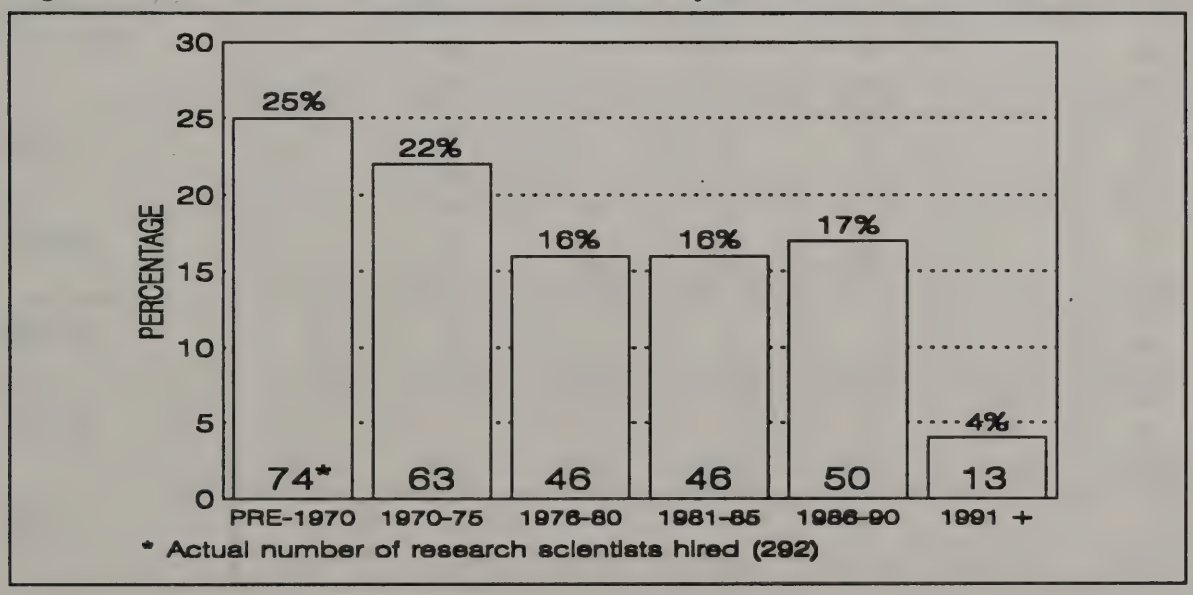


Table 12: Distribution of DFO Research Scientists by their Current Level and Year Hired

Year Hired	RES-1	RES-2	RES-3	RES-4	RES-5	Total
Pre-1970	-	20 (16%)	7 (15%)	30 (42%)	17 (65%)	**74 (25%)**
1971-75	-	21 (17%)	17 (35%)	19 (26%)	6 (23%)	**63 (22%)**
1976-80	-	19 (15%)	10 (21%)	14 (19%)	3 (12%)	**46 (16%)**
1981-85	-	31 (25%)	10 (21%)	5 (7%)	-	**46 (16%)**
1986-90	12 (57%)	31 (25%)	4 (8%)	3 (4%)	-	**50 (17%)**
1991+	9 (43%)	3 (2%)	-	1 (1%)	-	**13 (4%)**
Total	**21 (7%)**	**125 (43%)**	**48 (16%)**	**72 (25%)**	**26 (9%)**	**292 (100%)**

Table 13: Regional Distribution of DFO Research Scientists by Year Hired

Year Hired	S &F	Pac.	C &A	Nfld	Que	Gulf	Total
Pre-1970	36 (36%)	15 (22%)	15 (38%)	5 (13%)	1 (3%)	2 (14%)	**74 (25%)**
1971-75	23 (23%)	18 (27%)	11 (28%)	8 (22%)	3 (9%)	- -	**63 (22%)**
1976-80	17 (17%)	14 (21%)	6 (15%)	8 (22%)	2 (6%)	- -	**46 (16%)**
1981-85	14 (14%)	14 (21%)	4 (10%)	4 (11%)	7 (21%)	3 (21%)	**46 (16%)**
1986-90	8 (8%)	4 (6%)	3 (7%)	11 (30%)	16 (48%)	8 (57%)	**50 (17%)**
1991+	3 (3%)	2 (3%)	1 (2%)	1 (3%)	4 (12%)	1 (7%)	**13 (4%)**
Total	**101 (35%)**	**67 (23%)**	**40 (14%)**	**37 (13%)**	**33 (11%)**	**14 (5%**	**292 (100%)**

One-hundred and ninety-two (66%) DFO research scientists began their career in DFO. Seventy-five percent (220) of the current complement were recruited as RES-1s. Some research scientists (12%) entered this group from others such as biologists. Table 14 provides a composite profile of research scientists. In Newfoundland, 21 of their 37 RESs (57%) were recruited at intermediate levels higher than RES-1, even though for 89% of these, this was their first job and only 3 (8%) were Post-Doctoral Fellows. Of the 192 research scientists who began their career with DFO, 42 (22%) joined as Post-Doctoral Fellows.

The Post Doctoral Fellowship Program is an NSERC administered program which provides opportunities to recent PhD graduates to work in a field of research which is of particular interest for a determinate period (usually one year). Post Doctoral Fellows are paid at a minimum of RES-1 salary on a contractual basis out of operating dollars. They have no guarantee of indeterminate positions after the fellowship, but they are often considered when RES positions become available.

As noted earlier, mobility of research scientists is limited because of the highly specialized nature of their work. The average separation rate is about 6 percent per year. Since 1987-88, 82 research scientists have left the department due to a variety of reasons. It is interesting to note that since 1986, 12 research scientists have taken the work force adjustment cashouts and the last one to receive the cashout in June 1991 (as a RES-3) has re-joined the department (as a RES-4) under the Part-time Work and Term Employment program.

Appointments and reclassifications to the RES group reveal that since 1987-88, 95 research scientists have joined DFO from either within or outside the Public Service (Tables 15 and 16). This means that 32% of DFO's current RES workforce is relatively new. The majority of these 95 new entrants, 79 (83%) were new appointments to the RES group while the remaining 16 (77%) were reclassified into the RES group, most likely from the biologist or physical scientist group.

Of the 79 appointments to the RES group, 39% (31) joined in 1989-90 which is mostly attributable to the establishment of research programs at the Maurice Lamontagne Institute. Forty-nine of the 79 or 62% were recruited from outside the Public Service while the remainder were probably from other departments such as Environment.

Table 14: Composite Profile of DFO Research Scientists

Demographics	S & F (*n*=101)	Pac. (*n*=67)	C & A (*n*=40)	Nfld (*n*=37)	Que (*n*=33)	Gulf (*n*=14)	Total (*n*=292)
Average Years of Service	17.1	17.6	15.1	13.1	7.6	6.5	14.8
Began Career at DFO	64 (65%)	47 (70%)	11 (26%)	34 (89%)	23 (72%)	13 (93%)	192 (66%)
Post Doctoral Fellows	6 (6%)	12 (18%)	4 (9%)	3 (8%)	12 (37%)	5 (36%)	42 (14%)
Recruited above RES-1 level	15 (15%)	14 (21%)	10 (24%)	21 (57%)	10 (31%)	3 (21%)	72 (25%)
Recruited From Another Group	4 (4%)	7 (10%)	5 (12%)	9 (24%)	6 (19%)	4 (29%)	35 (12%)
Transferred out of RES (past 5 years)*	2	4	-	1	2	-	9
Scientist Emeritus**	-	7 (10%)	2 (5%)	-	-	-	9 (3%)
Retired/ Part-Time**	4 (4%)	-	-	-	-	-	4 (1%)
Female	10 (10%)	5 (8%)	5 (12%)	3 (8%)	4 (13%)	3 (21%)	30 (10%)
Visible Minorities	10	1	4	6	-	1	22 (7%)
Persons with Disabilities	1	-	3	3	-	-	7 (2%)

* **Nine research scientists transferred to another occupational group in DFO over the last five years. By definition, these are not part of the actual complement of 292.**

** **Scientist emeritus are not counted in current complement of research scientists (n=292), but retired/part-time research scientists are.**

Table 15: Appointments to RES Group in DFO

	1987-88		1988-89		1989-90		1990-91		1991-92		5 Yr Total	
	A[1]	B[2]	A	B	A	B	A	B	A	B	A	B
RES-1	-	4	1	10	1	10	3	3	-	8	5	35
RES-2	-	-	5	2	10	6	4	3	-	-	19	11
RES-3	1	1	1	-	2	1	-	1	-	-	4	3
RES-4	1	-	-	-	1	-	-	-	-	-	2	-
Total	2	5	7	12	14	17	7	7	0	8	30	49

[1] Within Public Service, but outside DFO
[2] Outside Public Service

Reclassifications to the RES group occur at a relatively low rate. They are usually from the biologist or physical scientist group. Over the past five years 16 DFO employees were reclassified into the RES group (Table 16). The 3 reclassifications from outside the Public Service were most likely from the National Research Council.

Table 16: Reclassifications to RES Group

	1987-88		1988-89		1989-90		1990-91		1991-92		5 Yr Total	
	A[1]	B[2]	A	B	A	B	A	B	A	B	A	B
RES-1	-	-	1	-	1	-	-	-	-	-	2	-
RES-2	5	-	-	3	1	-	-	-	4	-	10	3
RES-3	1	-	-	-	-	-	-	-	-	-	1	-
RES-4	-	-	-	-	-	-	-	-	-	-	-	-
Total	6	0	1	3	2	0	0	0	0	4	13	3

[1] Within Public Service
[2] Outside Public Service

2.6 Employment Equity Groups

Approximately 10% (30) of DFO research scientists are females, which is comparable to other federal science departments. However, distribution of females, both by level and region, revealed that females are under-represented in both areas.

Seven percent (22) of DFO research scientists are members of visible minority groups and 2% (7) are persons with disabilities. There are no Aboriginal research scientists. These data reflect self-identified groups and thus tend to understate actual representation.

Nine percent (25) of the research scientists are francophones, working primarily in Quebec and Gulf regions. Representation of francophones in the research scientist community in the Public Service is at 12%.

2.7 Overtime, Conference Attendance and Training

Research scientists, under their collective agreement, are entitled to claim overtime. There is no maximum RES salary beyond which overtime is not payable. As of December 10, 1992, $91,500 in overtime has been paid to eighteen (6%) of DFO's research scientists. The rationale for overtime in DFO is the type of research conducted which often involves many consecutive days of field work and ship time to gather data and test hypotheses. Six of the 18 RESs who claimed overtime were at the RES-4 and RES-5 levels.

A November 1990 study of scientific personnel in the Quebec region concluded that biologists claimed over twice as much overtime per employee than RESs in terms of both cash and compensatory time off. As noted earlier in Table 3, the average salary of a RES in DFO is about 1.5 times that of a biologist.

Data on how much is spent on conferences by research scientists in DFO were not readily available. However, the Science Sector spent approximately $438,000 in 1991/92 on conferences ($240,000 on international conferences). These costs include travel and registration fees for the conferences. Based on the Quebec study of scientific personnel, which reported that 80% of the funds allocated to international conferences in Quebec region was used by RESs, we extrapolate that the majority of the international conference dollars were spent by research scientists. The Quebec study concluded that research scientists attend more international conferences than biologists, physical scientists or engineers.

In 1991-92, five research scientists (out of a total of 7 employees in the department) were granted professional development leave with pay to participate in research programs in other countries. The duration of this leave ranged from 6 to 12 months for an average cost of about $68,000 per research scientist (salary forms a major portion of these costs).

3. Promotion Criteria and Process

3.1 Background

What constitutes a research scientist (RES) in the federal public service? Who are the key players that manage the RES group? How did the current set of promotion criteria evolve in the public service?

A research scientist is normally required to have a PhD, from a recognized university, in a field of natural science relevant to the work of the position. However, a bachelor's or master's degree may be acceptable if the individual has clearly demonstrated a research ability equivalent to that normally expected of a person with a PhD.

A research scientist's primary function is to contribute **original** additions to scientific knowledge by conducting, managing and evaluating scientific research within or outside the federal government (e.g., through contracts). A research scientist's secondary function usually is to provide scientific advice or apply existing knowledge and techniques **as long as** he or she has a predominant or continuing responsibility for scientific research and development. The generation of new knowledge is an essential difference separating the research scientist from the non-research scientists, such as the biologist (BI) and physical scientist (PC), whose primary function is the application of contemporary knowledge.

Treasury Board, as the employer, established the Classification Standard for the 4-level RES group in 1967. The standard describes the criteria for classifying positions in the RES group and evaluating the incumbent's ongoing performance to determine the incumbent's level. In this group, the Classification Standard is used not only at the time a position is created, but also as the incumbent progresses through the levels. For other Scientific & Professional groups, a Classification Standard is used to classify newly created positions to specific groups and levels, and performance is assessed against work objectives.

Another essential difference between the RES group and others in the Scientific and Professional category is that the promotion system in the RES group is "incumbent-based." RES promotions are based on productivity and achievements rather than on the requirements of a particular position as in the case of the other groups, such as BI and PC. Thus a researcher can remain in the same position and progress up the levels according to his/her level of productivity and achievements, which is determined by a departmental promotion board.

The salary administration plan for this incumbent based system is similar to other groups where an incumbent's salary is automatically increased to the next increment each year until

it reaches the maximum for the level or the incumbent is promoted to a higher level. In 1974 and 1975, the salary at each level was determined on the basis of annual performance (i.e. satisfactory- first increment above minimum; fully satisfactory- second increment; superior- third increment; outstanding- maximum). Quotas were imposed for the number of research scientists whose performance could be rated each year as superior (25%) and outstanding (5%). This performance-based salary system raised a great deal of criticism on the part of research scientists and the RES bargaining agent who were concerned about the reversibility of pay based on poor performance. The system was changed in 1976 to the lock-step system that exists now.

At the same time, in order to put a ceiling on the total salary bill for the RES group and presumably to avoid the inevitable push to higher levels for all, Treasury Board (TB) introduced a quota system that limits the number of scientists at the senior levels. The same percentages which were applied in 1974 and 1975 to superior (25%) and outstanding (5%) performance were transferred to the quotas for RES-3 and RES-4 levels respectively. This quota system reintroduced a competitive element to promotions, since research scientists in a sense have to compete with their peers for the limited vacancies at successive levels. Provided that the criteria used and the process followed both adequately assess the candidates and their contributions to the department, this competition is beneficial, since the best scientists should rise to the top.

In October 1990, Treasury Board revised the criteria used in appointment and promotions within the RES group. These criteria were issued following interdepartmental consultations carried out by the Working Group on the Management of S&T Human Resources. This Working Group is a subcommittee of the Interdepartmental Steering Committee on the Management of Science and Technology which consists of assistant deputy ministers of the major science departments (see Appendix H for committee membership).

The classification and promotion criteria were changed primarily to ease the bottleneck at the RES-2 level experienced in most departments at the time rather than to reflect substantial changes in how research scientists were assessed and evaluated. This bottleneck at the RES-2 level resulted from the 25% quota imposed at the RES-3 level and not because of problems with the Classification Standard or the criteria.

These revisions led to the development of a 5-level Classification Standard, which included an additional RES level between the former RES 2 and RES-3 levels. This new system was announced in May 1991 and was made effective retroactively to 1 October 1990, corresponding to the effective date of the collective agreement. Scientists who had been classified at the RES-3 and RES-4 levels before that date were automatically reclassified to the new RES-4 and RES-5 levels (see Table 17). Quotas of 25% for the former RES-3 level and 5% for the former RES-4 level were reassigned to the new RES-4 and RES-5 levels.

In addition, a quota of 20% for the new RES-3 was announced. Departments were advised that appointments to the new level should be phased in over a three-year period (1991-92 to 1993-94).

There is some flexibility in the quota rules in that departments have the option of not counting against their quotas, persons returning "to the bench" at the RES-4 and RES-5 levels from a position in the Executive group or scientists at these levels who have reached age 65. The first exclusion is meant to encourage management/science interchange, but it is more likely a mechanism to ensure that former EXs do not suffer any loss in salary from reductions in the management complement. In DFO, there are 5 former EXs in the RES group and four research scientists over the age of 65.

Table 17: Research Scientist Conversion Exercise

Prior to conversion (30 Sept. 1990)			After conversion (1 Oct. 1990)		
Salary range[1] ($)	Quota (%)	Level	Level	Quota (%)	Salary range[2] ($)
34,300 – 45,200	None	RES-1	RES-1	None	36,000 – 47,300
42,600 – 63,900	None	RES-2	RES-2	None	44,600 – 66,900
-	-	–	RES-3	20	56,400 – 74,200
56,700 – 74,000	25	RES-3	RES-4	25	67,600 – 82,400
66,300 – 83,400	5	RES-4	RES-5	5	74,000 – 90,200

[1] Rounded to nearest hundred

[2] Including 4.7% economic adjustment effective October 1990 and rounded to nearest hundred

A key player in the RES promotion process is the Interdepartmental Advisory Committee (IAC) for the Promotion of Research Scientists, which consists of senior representatives from the major federal science departments (Appendix H). This self-regulating body was created in the 1970s to help science departments apply the Classification Standard for RESs consistently and ensure that departments adhere to the merit principle for appointments and promotions. IAC's guidelines for preparing promotion dossiers give each department a uniform and consistent body of information on which to make promotion decisions. IAC reviews all recommendations for promotions that exceed the departmental quotas for the RES-4 and RES-5 levels and advises on whether the promotion criteria have been met. IAC also reviews all recommendations for all promotions beyond the RES-3 level for smaller science departments with a complement of less than 25 research scientists.

This limited role for IAC has evolved over the years and resulted from an internal review of its terms of reference in 1990. IAC obtains its authority from the deputy ministers of the employing departments and not from Treasury Board or the Public Service Commission, as

has often been assumed. In other words, although some people believe IAC makes final decisions on RES promotions, particularly to maintain the Treasury Board-imposed quota, this is not the case. Any deputy minister who chooses to ignore the advice of IAC is free to do so, while keeping in mind that the central agencies might take this as justification for a more thorough audit of that department's appointment practices. Although IAC tries to ensure that criteria are consistently applied, departments are relatively free to decide how to use the established promotion criteria and process, provided they do not deviate from the Treasury Board Classification Standard or quotas.

The research scientists are represented by the Professional Institute of the Public Service of Canada (PIPS). Prior to 1989, the research scientists had access to departmental grievance procedure but could not proceed beyond that. In 1989, a decision rendered by Paul Murby, chairman of the Appeal Board at the Public Service Commission (PSC) ruled that promotions within the RES sub-group were appointments without competition and under section 21 of the Public Service Employment Act, a right to appeal accrues when an appointment is made without competition only to those persons whose opportunity for advancement has been prejudicially affected by the appointment in the opinion of the PSC. Since this 1989 PSC ruling, there have been approximately 12 appeals (3 - Forestry; 3 - EMR; 3 - Agriculture; 3 - DFO), the majority of which were withdrawn after the "disclosure" process. In a presentation to the Scientific Research Group at their Annual General Meeting in November 1992, PIPS stated that the very nature of the Classification Standard for RESs is very vague and open to multiple interpretations and thus difficult to challenge. PIPS is in the process of communicating the right to appeal to the RES population and is consulting with the various committees (IAC and Working Group) and is also requesting observer status at IAC.

3.2 RES Complement

In terms of how many research scientists a department is authorized to have, TB has never allocated RES complements to departments, contrary to what was believed. However, as stated earlier, TB does impose quotas on the percentage of RESs in the higher levels. These quotas are based on the "authorized complement" for research scientists derived from figures "published" in Part III of the Main Estimates. The rationale for not using the actual number of research scientists in the department was that the budgeted figure would fluctuate less from year to year than the actual number and thus would provide a relatively stable figure against which to base the quotas. The figure published in the Main Estimates, Part III includes both research scientists (RES) and research managers (REM) as they are both sub-groups of the Scientific Research (SE) group. In theory, the quotas were meant to be calculated on the published figure minus the REMs.

In DFO, this Part III figure is determined each year by regional comptrollers and Personnel units and this information is passed on to Headquarters Finance for publication. In theory, to calculate the quotas of research scientists at senior levels, the DFO promotion committee

should have used a complement figure of RESs equivalent to the published figures minus the REM positions in DFO. However, they have been using (since at least 1988), a different figure which does not fully account for the REMs. Table 18 presents the published complement in Part III, the RES complement used by the committee and the actual complement of research scientists since 1987-88. It is noteworthy that the complement used to calculate the quotas is significantly higher each year than the actual number of RESs we have, and this difference has been increasing.

Table 18: RES Complement

Fiscal Year	Published Complement[1]	Complement Used[2]	Actual Complement[3]	Difference[4]
1987-88	291	291	275	16
1988-89	307	299	283	16
1989-90	315	315	306	9
1990-91	321	319	299	20
1991-92	335	325	301	24
1992-93	342	337	292	45

[1] As contained in Part III of the Main Estimates (includes both RES and REM).
[2] Complement of RESs used by DFO RES promotion committee.
[3] Number of RESs on strength.
[4] Difference between complement used and actual complement.

In conclusion, because the promotion committee is using RES complements which are significantly higher than actual figures to calculate the RES quotas, this provides for a greater number of RES openings at higher levels than would have been permitted if they had been calculated on the basis of actual complements. In 1992-93, the complement used would justify 22 more senior level RESs than would be justified by the actual complement. Given the fact that person-year controls will be eliminated in the coming year, a new benchmark must be found in calculating the number of research scientists required at the senior levels.

3.3 DFO Conversions/Promotions

Table 19 illustrates the number of research scientists who had their level upgraded either due to a promotion or as a result of the conversion exercise. The number of promotions in the RES group ranged between 5 and 6% of the total up to the time of the conversion process in 1991-92. In 1991-92, 100 (34%) RES-4 and RES-5 had their level upgraded due to the conversion. An additional 73 (25%) had their level upgraded due to promotions.

The conversion from RES-2 to RES-3 is considered as a promotion because it is not automatic but is based on meritorious performance.

In line with TB directives, DFO planned to convert 67 research scientists (23 in 1991, 22 in 1992, and 22 in 1993). In fact, 50 RES-2s were converted to RES-3 (23 in 1991 and 27 in 1992). In addition, all the original RES-3 and RES-4 were automatically converted to the new RES-4 and RES-5 levels (80 and 20, respectively). Treasury Board provided funding for this entire conversion exercise, $1.75 million over 3 years in the case of DFO.

Table 19 : RES Promotions and Conversions in DFO

	Before the Conversion				After
	1987-88[1] (n=270)	**1988-89[1] (n=282)**	**1989-90[1] (n=294)**	**1990-91[1] (n=305)**	**1991-92[1] (n=292)**
RES-1 → RES-2	10	10	11	5	14
RES-2 → RES-3	7	4	7	7	23[2] 27
RES-3 → RES-4	-	1	1	2	80[3] 4
RES-4 → RES-5	-	-	-	-	20[3] 5
Total	**17**	**15**	**19**	**14**	**173**
Rate of Promotion/ Conversion	**6.3%**	**5.3%**	**6.5%**	**4.6%**	**58.0%**

[1] Refer to the fiscal years in which promotions were granted. Except for some of the promotions relating to the 1991-92 conversions, promotions are usually effective the 1st of April of the following year.

[2] Effective April 1991

[3] Non-discretionary promotions resulting from the conversion of RES-3 and RES-4 in the old classification to RES-4 and RES-5 respectively in the new classification effective October 1, 1990.

The promotion process is usually conducted at the end of the fiscal year and the promotions for the successful candidates become effective the subsequent fiscal year. For example, the last promotion committee reviewed the candidates for promotion in February 1992 and the promotions were effective for fiscal year 1992-93.

The conversion process combined with regular promotions resulted in substantial salary increases for most of DFO's research scientists. For instance, they received a 4.7% economic adjustment effective October 1, 1990. In that same year, 80 RES-3 and 20 RES-4 under the old classification system received an average salary increase of $5600 and $3200 respectively when converted to RES-4 and RES-5 levels in 1991-92. Twenty-three of the former RES-2 were promoted to the new RES-3 level effective April 1, 1991, and 27 effective April 1992 for an average salary increase of $2900 and, finally, 23 other RES-1, RES-3 and RES-4 have been promoted one level since the conversion, for an average salary increase of $2-3,000.

Since the conversion, another 3% economic adjustment has been added effective April 1, 1992 to RES salaries in addition to the automatic annual 3-4% increment for those 55% (161) of incumbents that are not yet at the maximum salary for their RES level. However, like all other civil servants, RESs did not get any increases for 1991-92 and none are planned for 1993-94.

3.4 Promotion Criteria

The October 1990 Treasury Board Classification Standard sets out five criteria for determining the level to which a research scientist can be appointed or promoted. Individuals are promoted to the next level if their continuing and cumulative productivity and achievements meet these five criteria :

1. **Productivity**
2. **Creativity**
3. **Recognition**
4. **Leadership**
5. **Scope of Decision Making**

An individual need not contribute to all aspects of each criterion but must meet most criteria requirements before being considered for promotion to the next level. A matrix in the Classification Standard describes what is expected of the incumbent at each of the five RES levels (Appendix F). Each successive level sets higher productivity and achievement standards for the five criteria. The achievement levels for the five RES levels are described as follows :

- RES-1 is the normal entry level for junior research scientists;
- RES-2 is the **working** level research scientist with **average** cumulative achievements;
- RES-3 is the **experienced** research scientist with **above-average** cumulative achievements;
- RES-4 is the **mature** research scientist with **superior** cumulative achievements;
- RES-5 is the **exceptional** research scientist with **outstanding** cumulative achievements;

In summary, the five classification levels, RES-1 to RES-5, are defined in terms of entry, average, above average, superior and outstanding achievements with respect to the five criteria listed in the Classification Standard. There are no precise, quantitative benchmarks to assess achievement levels. This is left to the sole interpretation and judgement of individual departments. The matrix presented in Appendix F attempts to further define and clarify the meaning of the various achievement levels for each criterion and sub-criterion, but these definitions are still quite general and subject to discretionary interpretation. The following sections aim to provide only a general description of the promotion criteria listed in the Classification Standard.

3.4.1 Productivity

Productivity is defined as "identifiable outputs of a scientific or technical nature." Sub-criteria are **publications, reviews, innovation, technology transfer** and **cooperative research.** The standard states that undue importance is not to be placed on publications per se or on the mere number of publications without reference to their quality, impact and relevance to major problems and issues. However, the standard does not specify the importance to be attached to particular kinds of publications (e.g., refereed publications versus in-house reports). Moreover, the standard does not dictate how much emphasis is to be placed on publication productivity (in whatever form) and the other forms of productivity such as technology transfer and cooperative research. The employing department makes such decisions, though IAC attempts to maintain general consistency.

IAC guidelines require research scientists to describe their five major (productivity) achievements since their last promotion. Each achievement is to include reportables such as publications, patents or contracts. The research scientist must describe these in terms of their impact, significance and his or her level of participation. However, as stated earlier, it is the discretion of the department to decide how many publications, patents or contracts, and what impact, significance and level of participation constitute average, above average, superior and outstanding performance.

3.4.2 Creativity

Creativity is defined as "imaginative approaches, concepts and ideas for the advancement of research and the development of technology." The Classification Standard provides little further guidance on this criterion, but IAC guidelines state that creativity can include **new concepts, techniques, methods** or **systems, innovation** or **instrumentation for the advancement of research and the development of technology.** Again, the five levels of creativity are left to departments to assess and interpret.

3.4.3 Recognition

Recognition is defined as "stature in the scientific community as evidenced by international and national recognition." **Citations** in the scientific literature, **honours, invitations, awards,** and the incumbent's **role in scientific societies and committees** are all evidence of recognition.

3.4.4 Leadership

Leadership is defined as "influence on the scientific community and [the] direction of scientific programs." IAC has expanded this definition to include the following:

- **Scientific leadership** – How often do others inside and outside the government consult the incumbent about R&D matters?

- **Degree of influence** – What influence has the incumbent's work had on his or her field of specialization nationally and internationally (that is, how has the researcher influenced the direction of other scientists nationally and internationally?)

- **Program leadership** – How do the incumbent's leadership, management and influence affect the plans, policies and operations of the department or government?

3.4.5 Scope of Decision-Making

Scope of decision-making is defined as "latitude in determination and control of work." Included are the **degree of supervision,** the **independence** and the **judgement** (discretion) the incumbent exercises.

3.5 Application of Criteria in DFO

The criteria, by definition, are designed to measure scientific excellence. Productivity, creativity, recognition and leadership are all normal attributes of scientific excellence. Departments have the discretion to apply these criteria so that they can combine scientific excellence with relevance and usefulness of the research to the employing department. DFO uses the above criteria defined by the Treasury Board Classification Standard and recommended by the IAC guidelines on the preparation of RES promotion documentation.

Important modifications and additions have been made to these criteria in November 1992 because several research scientists expressed concerns after the 1991 – 92 promotion exercise. These amendments have broadened the range of outputs/achievements of research scientists but do not take into account the usefulness of these outputs to the Department. Table 20

lists the criteria DFO now uses. Amendments are in italics. The number in bold parentheses indicates the points assigned to each criterion; the total for five criteria is 60 points. There have been no new round of promotions since these changes.

DFO awards 10 of the 60 points to productivity, as evidenced by scientific publications and reports. As of November 1992, the other 10 points in productivity include departmental reports and other consultative contributions (such as CAFSAC meetings and reports). Prior to November 1992, these type of activities were not considered since they were not in refereed scientific journals. Although the criteria have been amended to reflect what research scientists in DFO are increasingly asked to do (to be discussed further in Chapter 4), the criteria still do not explicitly consider the relevance of the research scientist's contribution to the department's mission and objectives.

3.6 Promotion Process in DFO

The promotion process in DFO follows a two-tier approach involving regional promotion committees and the departmental Research Scientists Appraisal Committee (RSAC). The regional directors of Science (RDSs) hire all new entrants at the RES-1 and RES-2 levels except when a PhD equivalency or transfer from another group is involved. In that case, the RDSs have to consult RSAC. RSAC is responsible for all hiring, transfers and promotions to the RES-3, RES-4 and RES-5 levels. It does not handle the REM group or conversions from the EX to the RES group. These decisions are left to the Regional Directors General. RSAC also does not have any responsibility over the Emeritus Scientists or Part-time Research Scientists program. These are left to the discretion of the Regional Directors General and the Regional Directors of Science.

Table 20: DFO Promotion Criteria and 60-Point Rating Scale

Productivity (20)
Publications (10) Refereed papers Reviews Books and book chapters Special publications Other forms of productivity (10) Technology transfer Cooperative research *Technical or departmental reports* *Consultative and advisory contributions*
Creativity (10)
New concepts, techniques, methods or systems, innovation and instrumentation for the advancement of research and the development of technology
Recognition (10)
Stature in scientific community Citations in the literature Honours, invitations, awards Role in scientific societies and committees *Role in consultative and advisory activities*
Leadership (10)
Scientific leadership *(adjunct professorships, supervision of graduate students)* Degree of influence *(editorial work, refereeing scientific publications)* Program leadership
Scope of decision-making (10)
Degree of supervision Independence Judgement

Promotions from RES-1 to RES-2 are fairly automatic: where the RES-1 in question is at the top of the salary scale for that level, the regional promotion committee makes the decision and reports it to RSAC. Where a RES-1 scientist has yet to reach the salary maximum for that level, RSAC reviews the regional promotion committee's recommendations for promotion to RES-2.

3.6.1 The Process at the Regional Level

Each region has a promotion committee, but the composition of the committee and the procedures it uses vary. In part, this is because the number of research scientists in particular regions varies considerably. For example, in Gulf region, with 14 research scientists, the process is not as complex as in Scotia–Fundy region, which has 101 research scientists.

As a general rule, a regional promotion committee is chaired by the regional director of Science (who is in the Management category and is not necessarily a PhD scientist). Directors of Biological and Physical and Chemical Sciences and, in some cases, division chiefs (one level lower than the regional director and usually either REMs or EXs) sit on the committee. Three of the six regions (Central and Arctic, Newfoundland, Quebec) have senior research scientists on their committees. Only Newfoundland includes a representative from some of the internal clients of the research scientists. For example, the Director of Inspection Services, the Special Director for Northern Cod, and the Section Head from the Centre of Disciplinary Expertise in Atlantic Resource Assessment all sit on Newfoundland's promotion committee.

No general rule governs how the individual scientist enters the promotion process. During the annual appraisal exercise, the scientist's supervisor is expected to indicate whether promotion to the next level is recommended. Alternatively, the scientist may take the initiative and approach the supervisor and division chief to discuss promotion. Where there is consensus that promotion is warranted, a full dossier is compiled by the research scientist in accordance with IAC guidelines. If a supervisor or division chief does not support a promotion, the scientist may still proceed with the application, but the absence of the supervisor and division chief's support is inevitably an obstacle at the next level.

Most of the regional committees use the 60-point rating scale (Table 20) to rank scientists proposed for promotion. There are exceptions. In 1992, Scotia–Fundy used a slightly different point system that favoured primary publications. Gulf region has only 14 research scientists, so the committee assesses the scientists' suitability for promotion according to the criteria but does not use a point system.

After ranking the scientists, the regional committees send RSAC a list of the candidates recommended for promotion. Regional committees do not normally include the ranking information on these lists.

There is no formal limit on the number of scientists that the regional committees can propose for promotion. However, the committees must ensure that the candidates they recommend have at least the minimum qualifications to function at the proposed RES level. Regional managers, though, know how many promotions are available at each level, so they limit the number of scientists they recommend accordingly. Thus even at this stage, scientists who may be fully qualified for promotion to the next level may be screened out of the process. In 1992, in accordance with the Treasury Board directive on the conversion to five RES levels, RSAC informed each region that it could propose one half of its RES-2 population for promotion to RES-3. That restriction in 1992 was an anomaly, however, and was merely intended to prevent RSAC from being swamped while providing a reasonable basis for decision-making.

When a scientist has been rejected at the regional level, there is no prescribed procedure for informing him or her of the decision or for providing detailed reasons for the decision. However, the division chief (who often sits on the committee) usually informs the scientist. At present, there is no formal internal mechanism to allow an individual scientist whose promotion has been rejected at the regional level to appeal the decision. The scientist may, however, pursue the matter with the division chief, and in some cases the regional director of Science may, in consultation with the committee, include the scientist on the list of those recommended for promotion.

3.6.2 The Process at the National Level

The departmental Research Scientists Appraisal Committee (RSAC) is composed of a Chairperson (the Director General, Physical and Chemical Sciences), the Director General, Biological Sciences, and the six regional directors of Science. In addition, a representative of the Personnel Directorate provides administrative support to the committee during its deliberations but does not take part in promotion decisions.

Appendix G contains a flowchart depicting the annual promotion process in DFO. Usually by January, each RSAC member receives a set of complete dossiers on the scientists who have been recommended by the regions. In preparation for the RSAC meeting, each committee member independently examines each scientist's dossier and rates the scientist according to the 60-point system (Table 20). This is a very time-consuming process: in any given year before the conversion, the quotas allowed about 14-19 promotions, and RSAC

had to choose from about twice that many candidates. During the conversion (1991-92), the process took even longer: RSAC reviewed dossiers from about 110 candidates to select 74 (67%) allowed under the quotas. Table 21 illustrates the successful promotions by region which do not demonstrate any noticeable patterns over the last two years. It should be noted that 1991-92 figures are inflated due to the conversion exercise.

Table 21: Promotion Proposals by Region (all levels)*

	1990-91			1991-92		
	Proposals	Successful	%Success.	Proposals	Successful	%Success
Pacific	8	4	50%	23	17	74%
C & A	7	4	57%	17	12	71%
Quebec	3	0	0%	14	7	50%
Gulf	1	1	100%	5	2	40%
S - F	13	3	23%	35	24	69%
Nfld	4	2	50%	16	12	75%
Total	**36**	**14**	**39%**	**110**	**74**	**67%**

* Source: Extracted from RSAC annual meeting minutes

The RSAC meeting generally takes place in February. At the meeting, the regional director of Science who proposed a particular candidate introduces the individual's dossier. RES-3, RES-4 and RES-5 quotas prevent RSAC from recommending the promotion of all the scientists who meet the requirements. Scientists with the highest cumulative point scores are therefore selected first. The unfilled quota at a given level determines the cut-off point. Because each annual promotion exercise is entirely separate from those in subsequent years, scientists who have fallen below the cut-off in year 1 do not automatically go to the top of the list in year 2. They must re-apply in the manner described above.

RSAC arrives at a final list of scientists recommended for promotion and forwards this list to the deputy minister who has authority (delegated by Treasury Board) to make the promotions. If the department wishes to exceed its quota, it submits those recommendations to IAC for review. During the past two years, DFO has remained within its given quotas.

Following the last RSAC meeting in February 1992, the Chair of RSAC writes to both successful and unsuccessful scientists explaining the decision. In the case of unsuccessful scientists, the Chair's letter includes a brief explanation of what the committee considered the strong points of the dossier, as well as the reasons for the refusal of promotion. RSAC meetings are held behind closed doors, and neither members' remarks nor details of their ranking are divulged.

Research scientists can appeal the decision of the Committee to the Public Service Commission. In 1991-92, 4 appeals were launched against departmental promotion decisions. These were dropped following a disclosure meeting between the Chairperson of RSAC, union representative, personnel and the appellants. The Department accepted the appellant's case in one situation and the remaining three appellants withdrew their cases.

4. Issues Raised by the Study

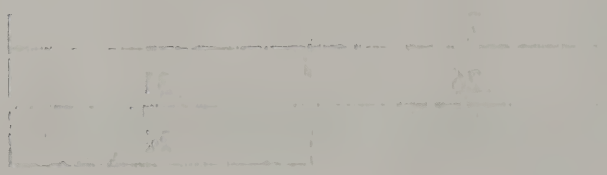
This chapter discusses the issues raised by the quantitative and qualitative data obtained from the interviews conducted with over 100 research scientists, senior managers, science managers and internal clients during the course of this study. Tables 22 and 23 provide a breakdown of the interviewed research scientists by level and by region. Appendix C contains the responses (by region and level) to the quantitative questions asked at the interviews.

Table 22: Research Scientists Interviewed by Level

	Number of RESs interviewed	Total number of RESs	% interviewed
RES-1	8	21	38
RES-2	28	125	22
RES-3	15	48	31
RES-4	16	72	22
RES-5	8	26	31
Total	**75**	**292**	**26**

Table 23: Research Scientists Interviewed by Region

	Number of RESs interviewed	Total number of RESs	% interviewed
Pacific	20	67	30
Central & Arctic	10	40	25
Quebec	11	33	33
Gulf	7	14	50
Scotia – Fundy	21	101	21
Newfoundland	6	37	16
Total	**75**	**292**	**26**



4.1 Role of Research Scientists

One of the major issues raised by this review is that many research scientists (69%) feel their role is not clearly defined in the department. This issue centres around long-term "basic" research versus shorter term "applied" research. Although most scientists and managers stated that their work is directly linked to the departmental objectives and priorities and they can identify their internal and external clients, some respondents were unsure of the research scientists' role in this department. Five of the six Regional Directors General (RDGs) interviewed also felt that the role of research scientists is neither clearly defined nor understood by themselves or the scientists. Half of the Regional Directors of Science (RDSs) felt that the role is clearly defined.

Table 24 illustrates that confusion over the role exists at all RES levels but is more prevalent at the lower levels (i.e., RES-1 to RES-3), which are the entry and working levels. Respondents in all regions except Newfoundland felt the role is not clearly defined. In Newfoundland, 50% of the scientists (three of the six respondents) had no problem understanding their role. However, because of the small sample size, this should not be considered significant.

Table 24: Is the Role of Research Scientists Clearly Defined?

	Yes		No		Don't know		No resp.		Total	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
RES-1	3	38	5	63	0	0	0	0	8	11
RES-2	5	18	23	82	0	0	0	0	28	37
RES-3	2	13	11	73	2	13	0	0	15	20
RES-4	7	44	9	56	0	0	0	0	16	21
RES-5	4	50	4	50	0	0	0	0	8	11
Total	**21**	**28**	**52**	**69**	**2**	**3**	**0**	**0**	**75**	**100**

Several scientists felt that their role was clearly defined when they joined the department. They were hired as "research scientists," to conduct original research but with the departmental shift toward service to the client, they do not see how "scientific excellence" fits into "service to clients." As illustrated earlier in Figure 1, 63% of the current research scientists were hired in the 1970s or earlier. They were recruited for their scientific excellence and were told that they would be conducting basic research into areas related to the department's mission.

The type of research undertaken is changing. Research scientists are increasingly involved in short-term activities in response to clients' identified needs. Researchers are obliged to service clients (e.g., participate on fisheries management and stock assessment committees; consult with client groups in the fishing industry), manage contracts, and seek, obtain and manage non-A-base resources. The time spent on these various activities varies from researcher to researcher, but the majority of them commented on this change in their work. Most scientists are trying to combine scientific excellence with these new activities, but they feel that the focus of promotion criteria has not shifted from scientific excellence (of which publications is the best single indicator). Most of these client-driven activities do not necessarily result in scientific publications. But, in most cases, scientists are producing reports (e.g., annual stock assessment papers; reports to funding organizations) that often require as much effort as a primary publication.

Research scientists, RDGs and RDSs were asked to define the qualities of a good research scientist in this department. In other words, what activities should we recognize and reward scientists for? Most scientists and RDSs stated that scientific excellence (creativity, publications, recognition, etc.) is the major quality of a good research scientist. The RDGs, on the other hand, added response to short-term departmental needs and communication skills. This essential difference in perception means that operational management and research scientists have different expectations, and to-date the promotion criteria and process has reflected the expectations of the research scientists.

There has been a gradual change in the role of at least some research scientists: they are already doing short-term, client-driven research. However, the research scientists felt that the existing promotion criteria do not recognize or reward this type of research. The next section examines the linkages between the changing role of research scientists and the promotion criteria and process.

4.2 Linkages Between Work Performed and Promotion Criteria and Process

Most scientists (65%) feel that the criteria adequately assess all relevant scientific productivity, but 59% feel that they do not reflect an appropriate balance between scientific excellence and client service (Q6 and Q7, Appendix C). Some scientists who have made the shift to client service stated that scientific excellence and client service are not mutually exclusive activities: rather, the former supports the latter. Some scientists are not concerned about the criteria, but they feel the emphasis on primary publications causes a gap between what they actually do and what they are assessed on. Less than half of the scientists (47%) felt that the criteria reflect what they actually do. This response was particularly prevalent at the lower levels (RES-1 to RES-3) (Q10, Appendix C). The majority of research scientists in Newfoundland (67%) and Scotia–Fundy (57%) felt that the criteria reflected what they actually did.

Over half of the RDGs and RDSs felt that the criteria assess all relevant scientific productivity but do not reflect an appropriate balance between client service and scientific excellence. RDGs realize that scientific excellence is essential for the scientific advice the department provides, but they wish to target this scientific excellence on effort directly relevant to departmental objectives.

More than 70% of the research scientists and all the RDGs and RDSs wanted the criteria changed to reflect client service – communicating with clients (radio, TV, meetings, reports), managing contracts, supervising students, other non-scientific administrative duties, and seeking, obtaining and managing external funds. Most respondents stated that either the current criteria should pay greater attention to client service or new criteria should reflect these activities explicitly.

However, another possibility is amending the process itself to reflect changing activities. Since many scientists want more attention paid to their service to clients (internal and external), perhaps these clients could rate the level of this service. However, 61% of the scientists stated that clients should not be part of the promotion process for a variety of reasons (too subjective; narrow in focus; personality issues). But the major reason that they stated was that clients are not qualified to assess the quality of science (Q16, Appendix C).

Four of the six RDGs wanted clients somehow involved in the promotion process, but most RDSs felt it would be too problematic and not a good indicator of performance for the same reasons cited by the scientists themselves.

Overall, the general theme from the interviews is that the research scientists perceive that the promotion criteria and process do not recognize and reward scientists for what they actually do. Scientists said the promotion process and criteria give them no incentive to provide service to the clients. Scientists are understandably reluctant to reduce the time they spend on primary research if doing so leads to a lower assessment of their scientific productivity.

4.3 Awareness and Understanding of the Promotion Criteria and Process

Scientists are all aware of the annual call letter and the detailed instructions for compiling their dossiers. Generally, the scientists (77%) understand the criteria (Q5, Appendix C) but not how they are weighted and applied. Even managers not involved in the promotion system (i.e., Fisheries and Habitat Management and Inspections) know something about the criteria. The majority of research scientists have a vague understanding of the actual regional and national process, although they know the committees exist.

There are many misconceptions about the promotion committee meetings and how scientists are rated (see the following sections).

Most scientists commented that open channels of communication ("remove the secrecy"), national and regional group meetings and discussions and more assistance from their immediate supervisor would clarify the criteria and process.

4.4 Fairness of the Process

Seventy-six percent of the scientists interviewed think the promotion process should be changed; this was consistently expressed across levels and regions (Q15, Appendix C). The scientists expressed many concerns about the whole process:

- Is the promotion process fair? Almost half of the researchers (49%) don't think so and another 20% just do not know (Q12, Appendix C). Those at the RES-2 and RES-3 levels particularly feel that the process is unfair (61% and 51%, respectively). The data do not prove conclusively whether this stems from the recent conversion exercise.

- Are "politics" and personalities at play behind closed doors at the regional and national committee meetings? There is the view that some RDSs are strong personalities who are much better at defending the scientists from their regions. Consequently their people get promoted. However, the rates of promotions within each region over the past two years do not support this perception (see Table 21).

- It is difficult for researchers in some disciplines to get recommended for promotions if those disciplines are not represented on the regional or national committee. External peer reviews at the regional and national level were suggested to give equal consideration and opportunity for each discipline.

- Certain kinds of research do not lend themselves easily to publication. For example, research articles on marine mammals are more difficult and much more costly to produce than articles on chemical reactions. Research scientists felt that these type of factors should be taken into account in the promotion process.

- The perception held by some individuals was that not all of the regional directors of Science have PhDs, and the division chiefs may not have the right background to evaluate the scientists' work and appreciate the subtleties of the various disciplines.

- Research scientists felt that it was important that the promotion process be seen to be fair, so many scientists recommended that senior scientists sit on the regional or national committee.

- Some research scientists believe that they have to apply a number of times before getting accepted for promotion. They think that submitting an application the first time ensures that they get known at the national level and that a running list is brought forward every year. In other words, you may not get accepted the first time, but the following years, your name will make it on the list. However, a review of the promotion files reveals that this is not how it works at the national level.

- Information on the scores of successful candidates is needed for benchmarks. Scientists want to know how many publications, for example, it takes to get a "superior" rating. They want some indicators to which they can aspire if they wish to be promoted.

- Scientists want to know how many vacancies there are at any given level. They feel that knowing their chances of success would help them decide whether it was worth the effort to apply, given the amount of time and effort it takes to assemble a promotion dossier.

- Scientists need more feedback when they are rejected at either the regional or the national level. At present, "post mortems" are left to the regional director of Science, who may talk to the scientist and supervisor or just leave it to the supervisor or division chief. Reasons for rejection are not clearly explained, nor are there any recommendations about performance enhancement. The promotion files that were reviewed supported this finding. Sometimes, the scientist received no written reasons for rejection. The supervisor may have given a verbal briefing to the scientist, but this is not recorded on the files. However, as stated earlier, modifications have been made to the process whereby, subsequent to the last promotion exercise in February 1992, the Chairman of RSAC wrote to each candidate.

- There is presently no appeal process for a research scientist who has been refused recommendation at the regional level. Scientists want some sort of mechanism that would allow them the opportunity to bypass the regional level in particular cases.

- The majority of research scientists stated that the annual appraisal cycle, workplans and the promotion exercise are not linked together. The appraisal form is supposed to trigger the promotion process for an individual scientist but, other than that, it does not play a significant role. They felt that the assessment of performance in annual appraisals is not necessarily recognized or rewarded through the promotion process.

4.5 Fairness in Applying the Criteria

Whether the promotion process is fairly conducted or not, another issue is whether the criteria themselves are fairly applied. The study revealed several concerns expressed by research scientists:

- The application of promotion criteria is not as visible and transparent as it should be. Seventy percent of the research scientists do not think the criteria are fairly or consistently applied or just do not know enough about the process to make a fair comment (Q13, Appendix C). There are no noticeable differences between the responses of the promoted and the not-promoted scientists.

- With changes in the department's priorities, scientists are asked to drop some projects and take on others in line with the new priorities. In this case, a scientist needs a number of years to establish and carry out the new research program and achieve the same rate of productivity as before. The current criteria do not give any credit for this type of change, either for scientific productivity or for meeting the department's objectives and priorities. The scientists feel that they are, in fact, penalized in both areas.

- Various regional committees seem to place a different emphasis on different criteria. The review of documents from the regions supports this perception. For example, as outlined in Chapter 3, the Scotia–Fundy region applied a slightly different rating system that favoured primary publications. In contrast, at the Institute for Ocean Sciences, there is more emphasis placed by the Regional Director of Science on client service, and the scientists appear to be more satisfied. Some smaller regions, such as Gulf, do not use a rating system at the regional level because of the small population of research scientists (n = 14).

- Too much attention is given to the quantity of publications without due regard to the quality. However, quality is harder to measure, and the scientists feel that the committee members would not necessarily have the background to be able to adequately judge the quality.

- Many scientists believe there is a hidden criterion for promotions, namely, whether you are at the top of your level (i.e., "if you're not at the top of your level, don't bother applying"). Scientists say if this *is* a criterion, then it should be clearly stated. The form for the promotion process asks scientists whether they are at the maximum of their level. What is the purpose of this question if it is not used for anything? Although this criterion does seem to be applied at most RES-1 lock-step promotions, it conflicts with the incumbent-based system (see Chapter 3). The data reveal that RES-1s are promoted automatically to RES-2 when they reach their maximum. However, for other levels, the data do not conclusively show whether scientists are promoted to the higher level only if they have reached their maximum at the current level.

The quota system for promotions and the travel restrictions on conference attendance were not cited as major concerns. It appears that scientists have resigned themselves to the quota system. Although conference attendance plays a role in assessing the recognition and sphere of influence of research scientists, the use of non-A-base resources and adjunct professorships may provide some of them with the financial means to get around the restrictions on conference attendance.

4.6 Other Issues

Science managers and scientists expressed concerns about how single operating budgets will affect the scientists' promotions. The flexibility of this new system might be an additional barrier to promotions (i.e., managers would use it as another excuse in addition to the quota). Some managers felt that it may also result in inter-regional differences: regions would be free to decide how they could best use their budgets (e.g., one region may decide that two biologists instead of one research scientist would meet their requirements or the promotion dollars could be used elsewhere in the organization).

5. Alternative Approaches

This study also examined the promotion criteria and process used in other federal science departments, other agencies, the private sector and other countries. Appendix D summarizes the practices in these departments, agencies and the private sector. Appendix E discusses the practices in other countries. This chapter highlights some of the practices that DFO could adopt.

5.1 Other Federal Science Departments

We studied five federal science departments: Agriculture Canada, Forestry Canada, Energy, Mines and Resources Canada (EMR), Environment Canada, and Health and Welfare Canada. All the departments follow the criteria outlined in the Classification Standard and the IAC guidelines. How the criteria are weighted and applied differs among departments.

It was very difficult to find out whether these departments conduct basic or applied research, most were reluctant to address this question. However, the trend appears to be toward applied research that is client oriented and shorter term. Most departments are struggling with this issue and are at various stages of transition to this type of research.

The Classification Standard and the IAC guidelines make it clear that "productivity" is the key criterion for assessing the incumbent. However, a department can choose *which* productivity sub-criterion (i.e., publications, reviews, innovation, technology transfer and cooperative research) to emphasize. Thus, to meet their operational needs, departments emphasize some criteria more than others. Some departments are giving more weight to productivity not related to publications. For example, EMR defines productivity as "the usefulness of the science and technology work in the short, medium and long term in meeting the needs of Canadian society and industry." Both Forestry and EMR place more emphasis on effectiveness of technology transfer and scientific creativity and innovation than on publications. These departments have promoted scientists with few primary publications to the RES-3 or RES-4 level primarily for their contribution to technology transfer. Health and Welfare, Agriculture and Environment apply equal weighting to the five criteria in the IAC guidelines. However, they concede that at the higher levels (i.e., RES-4 and RES-5), the weighting is in favour of scientific productivity and national and international recognition in the scientific community.

In addition, departments define "average", "above average", "superior" and "outstanding" research scientists which are outlined in the Classification Standard. The departments have

not formulated quantitative benchmarks for these type of decisions, but they feel that by consistently applying the criteria, they can rank the scientists in each level fairly accurately.

The departments use different processes for promotions. Agriculture, Environment and EMR have regional or sectoral committees that rank the scientists according to the five criteria and submit the ranked lists of recommended candidates to a national committee. The national committee does not repeat the ranking process but merely fits the cases into the established quotas. Discussion ensues in the case of conflicts or "cut-off" points. The national committee usually recommends scientists ranked highest by the sectoral or regional committees for promotions.

Forestry, on the other hand, a highly regionalized department, has regional and institute committees. These are not decision-making bodies, but they determine whether a candidate meets the criteria, and then they pass along their comments to the national committee. Regardless of the regional recommendation, any scientist may submit a dossier to the national committee. The national committee ranks all candidates and makes a final decision. At Health and Welfare, all the research scientists work in Ottawa. There is only one departmental committee, which reviews all submissions. Since the population is relatively small (n = 133), this committee makes the decisions simply on the basis of discussion and not on any formal ranking.

The regional committees generally include the directors or chiefs and, notably, a research scientist at the RES-4 or RES-5 level. For the most part, this person represents the RES community's views and provides a peer review. Also noteworthy is the fact that at Forestry, the regional and institute committees are composed of the RDG and program directors. Not all the RDGs have a scientific background (three out of the eight have an economics background), but the general consensus is that they are able to assess the impact of the scientists' work on technology transfer.

Senior science managers, who are also the departmental representatives on the IAC, usually chair the national committees. Most national committees also have rotating senior research scientists from the regions. As far as possible, the senior research scientist(s) are selected to represent the range of research disciplines within the department. For example, at Environment, the national committee has one research scientist at the RES-5 level from each service that employs a significant number of research scientists. In Forestry, the RDGs, institute DGs, and the DG of Personnel also sit as full members on this committee. The Chairperson of Forestry's national committee is not a voting member.

As a general rule, the departments do not have external peer reviews. It is usually the role of the senior research scientist(s) on the committees to solicit this if and when required. No department asks for input from external or internal clients.

As mentioned earlier, the other group in the Public Service which uses an "incumbent-based" promotion system is the Defence Scientist group. The Department of National Defence (DND) employs approximately 566 defence scientists (DSs), who engage in scientific research and development, scientific analysis, liaison and advisory functions. The DS Classification Standard is incumbent oriented, and the Salary Administration System provides a rate of salary progression commensurate with how the employee is developing professionally. There are eight levels in the DS group. The employees' state of professional development determines their level and is based on three criteria:

- effectiveness and productivity in scientific research, development and analysis as measured by their level of expertise, their creativity, their contributions to the department, their scientific recognition and their impact on the quality, scope or direction of departmental activities and/or additions to scientific or technical knowledge;

- effectiveness and productivity in representational and human relations activities; and

- effectiveness and productivity in managerial activities.

Interestingly, DND's process allows for acceleration and deceleration of the scientists in these eight levels. They deal with the issue of non-performance at a given level by reclassifying employees to other groups so that there is no loss in salary but perceived status. Some voluntary demotions have also taken place.

5.2 Other Agencies

The other agencies we studied were the National Research Council of Canada (NRC) and Atomic Energy of Canada Limited (AECL). NRC, because of economic restraints and cutbacks, is shifting from "pure" research to more targeted research that contributes to its aims and objectives. NRC is addressing the research needs of Canadian industries, who are their major clients. However, the career progression for scientists is modelled after the university system: junior, assistant, associate, senior and principle research officers. The criteria used focus on scientific excellence: quality of research or problem solving; level and extent of scientific or technical knowledge; planning ability; leadership; technology transfer and industry liaison; peer recognition; and administration. Primary publications and citations are also used to measure some of the above criteria. NRC is currently in the preliminary stages of re-engineering their compensation system for research officers.

At AECL there is no longer any basic research under way; almost all the scientific work is applied research. AECL uses the same process for promoting its research scientists and engineers – performance, evaluated according to agreed upon goals. Number of publications and international reputation are not criteria for advancement.

5.3 Private Sector

Bell Northern Research (BNR), Spar Aerospace, and Hydro Quebec were contacted. BNR, the research arm of Northern Telecom, employs about 100 scientists to carry out basic research in the telecommunications field. BNR uses several criteria to promote research scientists: decision-making scope and judgment; problem solving; analytical and technical competence; leadership impact; education and experience; interpersonal skills; and range of contacts. Productivity is also a criterion but it is measured by the production of useful devices and products and not publications. Thus, the scientists are expected to work on projects that would benefit the organization and are rewarded accordingly.

Spar Aerospace employs about 350 engineers in applied research in its satellite communications activities. The company does not engage in fundamental research except by contractual arrangements with government agencies. Moreover, Spar engineers are involved in all aspects of projects from the design phase to product development, so their involvement is not limited to research as such. Appointments and promotions are linked to the employee's level of responsibility. Salary increases are based on three factors: number of years of job-related experience since leaving university; annual performance rating scores; and recommendations from the employee's supervisor.

Hydro Quebec employs about 140 scientists to carry out applied research on the generation, transmission and consumption of electrical energy. The scientists are also involved with the transfer of technology and sale of services to external clients. Classification of scientists is based on four criteria: nature and extent of activities (complexity and difficulty of assignments); scope of decision making and independence; contribution to the needs of the organization; and professional standing both inside and outside Hydro Quebec.

The above agencies and companies studied indicate that the pattern in the private sector is to promote scientists on their contribution to the organization's priorities. Scientific excellence may be a criteria for hiring but once on the job, the scientists are expected to benefit the organization by responding to its needs. That does not mean that scientific excellence is not important, however, it is a prerequisite for work to be useful to an organization. What this means is that a scientist's performance is judged primarily on the usefulness of his/her work, and not solely on its scientific merit. The scientific merit is judged indirectly via the quality and usefulness of the scientist's output.

5.4 Universities

Large universities use slightly different methods to evaluate research contributions. Faculty members in traditional disciplines (chemistry, philosophy, physics, etc.) are evaluated for whatever research they choose to be good at. But those in applied fields (engineering, forestry, fisheries, etc.) must also show that their research has some relevance to the

"problems" or "issues" in society. Excellence usually triumphs over relevance as a criterion for promotion, but where there is a shortage of excellence, relevance tends to come to the fore when the dean presents a candidate for promotion. Other criteria, such as teaching and administrative service, influence the decision to promote, and these in turn are often given more prominence if excellence and relevance are a bit weak.

Universities believe in peer reviews, though they are an endless topic of debate (for example, there have been controversies in the past few years in the United States, France and the United Kingdom). Nevertheless, peer assessment, by either internal processes (promotion committees) or external referees, is almost universally considered essential to the promotion process.

Universities have recently been criticized for placing too much emphasis on research in promotion decisions. They have responded by recognizing other contributions, such as patents and copyrights, that reflect the transfer of knowledge and know-how from the research laboratory. But the primary emphasis is on excellence.

5.5 Other Countries

Dr. Larkin, retired Vice-President, Research, University of British Columbia gathered information on the promotion process and criteria used for government research scientists in United States, United Kingdom, Australia, New Zealand, Germany, China, Japan, Iceland and Norway. Appendix E provides an overview of the practices in these countries while the following provides the highlights from this overview.

In other countries, government research scientists are evaluated by a mixed set of criteria: excellence in research; relevance to the laboratory's mission; and service to the laboratory in administrative or extension roles.

Recently there has been a worldwide trend to ask other questions. Is the research relevant to the organization's mission? What tangible benefits does (or will) society get from the application of the research findings? At the same time, there has been a trend to precisely define the criteria for promotion and develop more elaborate evaluation procedures. If all researchers are expected to perform both research and service roles and if research counts for more than service, the employee must know by how much, so that effort may be apportioned in relation to the rules of the reward system. And if the employee is hired to be a research scientist, then the criteria should be weighted so as to ensure that a substantial research productivity is essential for promotion.

These trends are leading to the use of performance appraisal systems which are similar in form to that for non-research scientists, but with different criteria for promotion. Performance is measured against agreed upon work objectives at the outset and promotions are linked to the outputs and achievements of the individual.

The Australian Commonwealth Scientific and Industrial Research Organization appears to be the furthest along in developing a comprehensive "performance planning and evaluation program" which is based on the premise that promotions should be based on the satisfactory achievement of agreed upon work objectives and competencies. Promotion is on merit and not on the basis of establishment positions such as our quota system. All staff are reviewed annually. They define critical competencies such as application of knowledge and elective competencies such as communication. Performance as measured by publications is downplayed and citation indices are not used. Some consideration may be given to international reputation and overseas invitations but, for the most part, the new system is strongly oriented to results that are immediately tangible and applied.

New Zealand has a single nation wide competition for promotion for fisheries research scientists which takes place every 2 years. Merit and priority for promotion are based on technical and management competence in addition to personal attributes and educational and professional achievements. Benchmark positions are established by interviewing a selection of scientists.

The system in the United Kingdom follows a standard performance appraisal model which focuses on personal qualities, approach to work, communication, management and technical skills.

Norway's promotion process for research scientists parallels that of universities where scientific publications are most important. However, they are moving towards placing more emphasis on the relevance of the research but this is done in the evaluation of the project rather than in the evaluation of the scientist.

6. Proposals for Action

In this chapter, we will present some proposals for dealing with some of the issues identified by this study. Before doing this, though, we need to take a look at the external environment. This environment will have a significant effect on the future of science and technology at DFO and is the context into which the proposals must fit.

6.1 External Environment

Several factors are affecting the research scientist community or are expected to do so in the future:

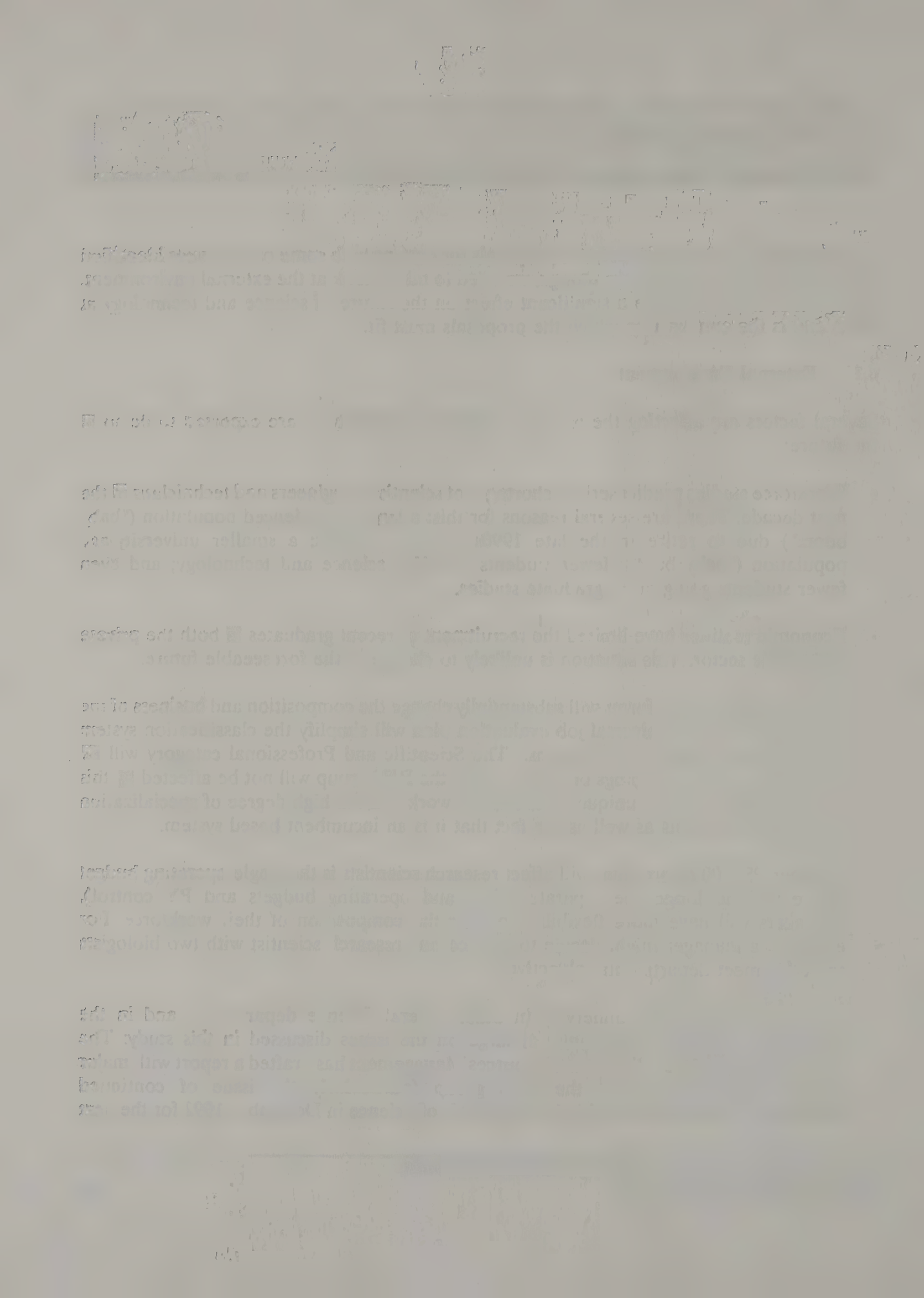
- Workforce studies predict serious shortages of scientists, engineers and technicians in the next decade. There are several reasons for this: a large, experienced population ("baby boom") due to retire in the late 1990s and early 2000s; a smaller university-age population ("baby bust"); fewer students choosing science and technology; and even fewer students going on to graduate studies.

- Economic realities have limited the recruitment of recent graduates in both the private and public sector. This situation is unlikely to change in the foreseeable future.

- Public Service 2000 reforms will substantially change the composition and business of the public service. The universal job evaluation plan will simplify the classification system by combining several classifications. The Scientific and Professional category will be subjected to these groupings but at this time, the RES group will not be affected by this exercise because of the unique nature of the work and the high degree of specialization of research scientists as well as the fact that it is an incumbent based system.

- Another PS2000 reform that will affect research scientists is the single operating budget (there will no longer be separate salary and operating budgets and PY control). Managers will have more flexibility to alter the composition of their workforce. For example, a manager might decide to replace one research scientist with two biologists to better meet departmental objectives.

- There is some activity underway in other federal Science departments and in the government scientific community at large on the issues discussed in this study: The Working Group on S&T Human Resources Management has drafted a report with major recommendations affecting the RES group (particularly the issue of continued productivity) which was provided to all ADMs of Science in December 1992 for the next



meeting of the Interdepartmental Steering Committee on the Management of Science and Technology in the new year. This report and its recommendations, if adopted, will have major implications for the RES community; Energy, Mines and Resources are exploring a variety of options to rejuvenate their aging scientific community; NRC is just commencing a review of the compensation system for their Research Officers and any changes they make may have implications for the RES group.

- Finally, cutbacks in the Executive Group, according to Treasury Board, are causing some EXs to seek classification as research scientists or research managers. The rationale provided by Treasury Board for this conversion is that these individuals are specialists rather than managers. However, the underlying reason is to maintain the salary levels for these individuals while at the same time reducing the number of persons classified as EXs. In 1992-93, DFO has eight research managers (REM) and 5 RESs who were former EXs.

6.2 Recommendations

The recommendations being proposed result from several considerations:

- the external environment discussed above;
- internal changes in DFO;
- a synthesis of the evolution of the RES group within the federal public service;
- the demographics of the population;
- the issues raised by this study; and
- an analysis of the practices in other departments, the private sector and other countries.

Because the recommendations cut across all of the issues we raised in Chapter 4, we have grouped them into overall, performance, criteria, process, committee membership and communications issues.

6.2.1 Overall

DFO needs to resolve the "base" issue in calculating quotas for research scientists at the 3, 4 and 5 levels. Given that there is a wide gap between the budgeted and actual complements of research scientists in DFO and the use of quotas based on the budgeted complement is yielding a higher proportion of research scientists in the upper category, it is recommended that :

RECOMMENDATION 1

The quotas for RES-3, RES-4 and RES-5 levels in DFO should be calculated on the basis of the actual number of research scientists in the Department. In order to avoid spurious fluctuations, the calculation could be based on the average actual complement for the last three years, or any other meaningful time period. Any further appointments, promotions, conversions or reclassifications to the RES group should be carefully monitored by the ADM, Science to ensure that the quotas thus calculated are not exceeded.

The average number of research scientists over a specified period of time such as the last three years is suggested to compensate for fluctuations in numbers due to normal attrition. Using this figure as a basis for the quotas would ensure that they are closer to the actual population of research scientists. However, it should be noted that quotas are to be used as upper limits for the number of research scientists at senior levels and not necessarily as targets that have to be met.

According to the Classification Standard, research scientists are supposed to add to the body of scientific knowledge by generating new and original concepts. The work of research scientists in DFO is evolving towards shorter-term application of knowledge rather than long-term pure research. Research scientists and managers have clearly stated that the nature of the work of research scientists is changing. Research scientists are increasingly being asked to do work that may not fit appropriately into what a RES, by definition, is supposed to be doing. The changing nature of the work has also fuelled some of the criticism about the RES promotion process. Several scientists mentioned that more and more of their work is not recognized for promotion purposes. It may be that these scientists are not classified in the appropriate group rather than inherent problems with the promotion process.

RECOMMENDATION 2

DFO should review the classification of employees in the RES group to determine whether, based upon their current activities, all incumbents are appropriately classified as research scientists.

6.2.2 Performance

RES classifications are based on predetermined levels of performance, and scientists are appointed or promoted to their levels on the basis of their current and cumulative performance. The current promotion system is unidirectional in that once a research scientist is promoted, no further review is conducted to determine whether he/she continues to perform at that level. Annual appraisals are conducted but they are not closely linked to the promotion process, with the exception of triggering in some cases the promotion process. The system appears to allow for demotions, based on reduced performance levels. However, there is no record of a RES ever being demoted at DFO. Research scientists interviewed, themselves, raised the issue of deteriorating performance at senior levels and suggested the situation needed review.

Other federal science departments are also struggling with this issue and the Interdepartmental Working Group recommended in December 1992 to the Interdepartmental Steering Committee on the Management of Science and Technology to introduce a formal review process to ensure that scientists maintain their level of productivity or are assigned to other areas of responsibility.

The asymmetry of the promotion process combined with the literature on age and scientific productivity which suggests that there may be an inverse relationship in terms of creativity and scientific excellence, raises the question of exploring mechanisms which reward current and ongoing productivity. RES-1 and RES-2 are entry and working levels, respectively, and should remain as such. However, promotions to RES-3, RES-4 and RES-5 constitute rewards for above average, superior and outstanding performance levels which need to be justified on an ongoing basis. If a research scientist ceases to perform at these levels, he/she should move down to a level that is commensurate with his/her level of productivity. Thus, the promotion could take the form of an appointment for a fixed, pre-determined period of time or some type of merit pay based on performance. The annual appraisal process could play an active role in the ongoing assessment of performance levels against the Classification Standard.

RECOMMENDATION 3

DFO, in conjunction with other federal science-based departments, should explore options (such as appointments to 3-year terms for RES-3, RES-4 and RES-5 or some type of merit pay) for ensuring continued scientific performance at all levels, such that levels of pay are commensurate with current levels of productivity. More consideration should be given to using the annual performance evaluations for ongoing performance assessment and promotions.

6.2.3 Criteria

A significant number of research scientists and managers interviewed stated that the promotion criteria need to be modified to give sufficient consideration to their changing role. The criteria do not reflect, in some instances, what they are actually doing. It must be noted that the criteria cannot be altered substantially since they are interdepartmentally established and that to a greater extent they need to reflect what a RES is supposed to be doing according to Treasury Board's classification standard. However, departments are allowed considerable discretion in interpreting the criteria to meet their operational needs while keeping within the general framework.

As evidenced in other countries and in the private sector, the trend is to move towards recognizing and rewarding those research scientists who more directly benefit the organization. Scientific publications are being downplayed in favour of tangible benefits resulting from the application of the findings.

Research scientists and research managers have raised concerns with the current criteria and stated that they need to be modified to reflect operational demands within the context of scientific excellence. The service to the client philosophy needs to be clearly outlined in the criteria as it is the direction in which the Department is moving. Both research scientists and managers felt that undue weight may be given to quantity of publications rather than quality and that seeking and managing non A-base resources is not recognized or rewarded. Amending the criteria to reflect these concerns may serve as an incentive for research scientists to make the transition to changing expectations of their role in this Department. They will be more apt to contribute to activities which are useful to the Department if they know they will be recognized and rewarded for them. Therefore:

RECOMMENDATION 4

DFO should amend, within the context of the existing Classification Standard, its current criteria for promotion of research scientists and their application as follows:

4.1 Emphasize relevance of the research to the department's objectives and priorities as measured by tangible benefits to internal and external clients resulting from the application of the research findings. Develop some practical means of measuring both the high quality and the relevance of a scientist's contribution.

...cont'd

RECOMMENDATION 4 (cont'd)

DFO should amend, within the context of the existing Classification Standard, its current criteria for promotion of research scientists and their application as follows:

4.2 Add as a criterion the ability to communicate effectively with internal and external clients (e.g., responding to scientific queries; participating on advisory committees; representing the department in schools, universities, and the media).

4.3 Recognize the seeking and managing of non-A-base resources, particularly to meet the needs and priorities of DFO in the short term.

6.2.4 Promotion Process

Given that there exist significant misperceptions and concerns about the current promotion process :

RECOMMENDATION 5

DFO should amend the current promotion process for research scientists as follows:

5.1 Consider the possibility of convening the promotion process every two years since the annual process is labour intensive and time consuming for both research scientists and managers.

This is especially true if Recommendation 3 is implemented and all RES-3, RES-4 and RES-5 have to be reviewed periodically for both promotions and to justify current classification levels.

...cont'd

RECOMMENDATION 5 (cont'd)

DFO should amend the current promotion process for research scientists as follows:

5.2 Candidates for promotion should be identified through the annual appraisal process. Upon endorsement by the regional director of Science or the regional promotion committee, a full dossier should be compiled by the immediate supervisor in consultation with the research scientist and the regional director of Science. The regional director general should have final sign off prior to the dossier being forwarded to the national level.

The committee at the national level would then be responsible for applying the rating scale based on the revised criteria within the established quotas. It would review candidates for promotion as well as periodically review continued performance against the Classification Standard for RES-3, RES-4 and RES-5s.

5.3 The regional director of Science should periodically solicit input from external clients (for whom the work was conducted) to determine the degree to which research programs were useful and met the identified needs. This information should be incorporated into the promotion dossier of the particular research scientist involved.

5.4 A list of promoted candidates should be circulated to all research scientists and appropriate managers.

5.5 The Chairperson of the National Committee should inform each RES in writing whether they are promoted, demoted or continue to meet the standards at their current level. Regional directors of Science should discuss the reasons for rejection or demotion with each research scientist concerned and give explicit guidance and direction on how to enhance performance.

6.2.5 Committee Membership

Research scientists raised a number of concerns about the promotion committees at the regional and national level. These range from politics and personalities on the committees to the committee members' lack of knowledge of the subtleties of various researchers' disciplines. These concerns call for more fairness and transparency, or perceptions thereof, in the selection of promotion committees' membership.

Promotion committees in other federal science departments include senior research scientists who are selected for their expertise in selected disciplines and to represent the working research scientists' concerns rather than management's. These committees also solicit external input if and when required and this brings a quasi peer review in the promotion process.

To add to the perception of the process being fair and transparent, some departments also appoint working level research scientists, on a rotating basis, as observers on their promotion committees. Although the details of the committee's deliberations are confidential, this helps to alleviate any misconceptions about how the promotion process is actually conducted when these committees meet.

Although, research scientists interviewed did not favour client input in the promotion process, client input is an important factor in assessing research scientists performance, especially when the Department is moving towards client-oriented research based on identified needs.

There are several operational managers in the Department who are internal clients of research scientists and could be included in the promotion committees and therefore provide the required client input. In particular, directors of Fisheries Operations and Inspection Services could comment on the relevance of the research performed.

To address the concern over the fact that scientists are being evaluated by scientists with limited management input, the committee membership could be broadened to involve at least one Regional Director General and the Director General of Personnel. This practice works in Forestry Canada and contributes to ensuring that the contribution to the Department's needs is being given sufficient consideration in the promotion process.

In conclusion, the current misconceptions and misperceptions about the unfairness of the promotion process and the inequities in application of the criteria require a change in the composition of the promotion committees.

RECOMMENDATION 6

The membership of DFO promotion committee (s) for research scientists should be expanded to reflect senior management input, client involvement, senior scientists, working level scientists and, if feasible, gender balance.

Regional promotion committees should comprise both voting members and observers:

Voting members

- regional director of Science, Chair
- division chiefs, Biological Sciences, Physical and Chemical Sciences
- senior scientist (RES-4 or RES-5), Biological Sciences
- senior scientist (RES-4 or RES-5), Physical and Chemical Sciences
- regional director, Fisheries and Habitat Management and/or Inspection Services

Observers

- working-level scientist (RES-2) (rotating)
- regional director of Personnel

The **departmental promotion committee (RSAC)** should comprise both voting members and an observer:

Voting members

- two regional directors general (rotating)
- Director General, Physical and Chemical Sciences (Chair)
- Director General, Biological Sciences
- Director General, Personnel
- regional directors of Science
- Director General, Fisheries Operations, Habitat Management or Inspection Services
- senior research scientist (RES-4 or RES-5), Physical and Chemical Sciences
- senior research scientist (RES-4 or RES-5), Biological Sciences

Observer

- working-level research scientist (RES-2) (rotating from regions)

6.2.6 Communications

From the interviews conducted with research scientists in all regions, it is very clear that there exist major communication problems about the promotion process and the criteria used. In order to ensure that these are clearly understood and that research scientists perceive the promotion process and the application of criteria to be fair and transparent, it is proposed that :

RECOMMENDATION 7

DFO should provide each research scientist with a package that (*i*) outlines the DFO promotion criteria and related benchmarks; and (*ii*) clearly describes the regional and national promotion process (with lists of committee members and terms of reference).